THE AUTOMOBILE

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YOUNG LONG ISLANDERS TO HAVE A CUP RACE

MINEOLA, N. Y., Oct. 25.—There will be another cup race on Long Island, and it will take place on Saturday afternoon on the famous Jericho Turnpike. Robert Ray Allen, aged four years, is the donor of the trophy, and, unlike William K. Vanderbilt, Jr., who gracefully withdrew when he learned that the other entrants objected to his eleventh hour participation, the Mineola lad, with the unanimous consent of his companions, will endeavor to win his own cup. Ever since the Vanderbilt Cup race began to interest the outside world, and particularly Long Islanders for obvious reasons, the coming generation has produced many would-be Wagners, Lancias and Tracys. Mineola has been a prolific vicinity for the future pilots of the hurtling monsters, and the knowledge of its small boy concerning automobile racing is complete and pugnacious, for he believes that he can pick the winner with a greater degree of certainty than those more advanced in years. In the early morning practise preceding the October 6 event this same small boy was prominently in evidence at the breaking of the dawn. While there may not be as many present as on the other occasion, the old Turnpike Saturday will attract as enthusiastic a throng as witnessed the international contest. Recently there was an elimination for the purpose of trying out the motive power of the diminutive racers, with the result that several pushers—pushing is within the rules in this race—obtained their releases, to be replaced by sturdier and better air-cooled assistance. The mechanician is an important factor in Saturday's race; in fact, he is likely to be almost the whole thing.

Photo by W. B. Skidmore.

THE YOUNG CANDIDATES FOR THE ROBERT RAY ALLEN CUP—THE DONOR DRIVES CAR No. 10.

THE SPEEDWAY ACROSS LONG ISLAND

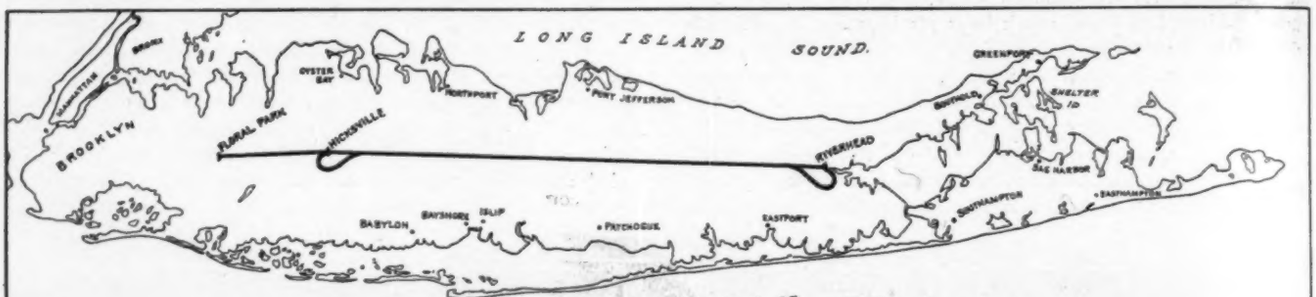
THE first automobile speedway ever constructed in this or any other country will be built on Long Island, and ready for use in less than a year, if the plans of the company headed by William K. Vanderbilt, Jr., materialize with the degree of speed that would appear probable, judging from the extraordinary and widespread interest taken in the plan.

Upon the heels of the Vanderbilt Cup race came a unanimous conclusion that to attempt another road contest under similar conditions was utterly out of the question. A privately-owned course was agreed to be the only means by which another race could be thought of, and the offers of support were so numerous that a start was made immediately, looking forward to the construction of a speedway. Mr. Vanderbilt, Chairman Thompson of the A. A. A. Racing Board, and several leading American makers, formed the nucleus of those who promised support.

The plans are still under discussion. The general scheme provides for a straightaway road of 65 or more miles that will extend from Floral Park through the center of Long Island to Riverhead. The idea takes on a more practical phase than the mere building of a race course, the proposition being to provide an automobile highway whereon manufacturers will have opportunity of thoroughly testing their cars, individuals will have a place access at frequent intervals. Each tollgate will take the form of an old English inn, where the motoring public will be privileged to refresh themselves under club conditions. Each inn will be provided with its garage, charging and supply station, oil-sprinkling equipment, road repairing tools and material, and will be controlled by the company promoting the scheme. The route of the highway is purposely withheld for the present. It will be a highway in the broadest sense of the word, and although it will be especially constructed for the purpose, it will follow the natural grades and bends incidental to all general public highways.

The Plan and Scope Committee, consisting of W. K. Vanderbilt, Jr., chairman; Jefferson DeMont Thompson, Ralph Peters, Dave Hennen Morris, A. R. Pardington and Dean Alvord, will hold another session this week, and the work already started will be pushed without any hesitation, the intention being to have the road ready weeks before the time for holding the Elimination Trial for the next Cup race.

Such well-known makers as Henry B. Joy, president of the Packard Motor Company; E. R. Thomas, of the Thomas Motor Company; Henry Ford, of the Ford Motor Company; Windsor T. White, of the White Sewing Machine Company; H. H. Franklin, of the Franklin Manufacturing Company; A. L. Riker, of the Locomobile Company of America, have given assurances of financial support. Windsor T. White, in sending a subscrip-



where they can drive to the limit of speed, and, incidentally, a course will be made for the Vanderbilt Cup or any other international trophy by providing wide turns at two points along the road, possibly Hicksville and Riverhead. Since the road would be fifty feet in width, there would be plenty of room for passing in opposite directions on the straightaway.

An informal meeting of those interested in the project was held at the Lawyers' Club, 120 Broadway, New York City, October 18, at which time Long Island was selected as the location for the speedway. Of the $2,000,000 required, $400,000 was pledged at this meeting, those present including August Belmont, William K. Vanderbilt, Jr., Ralph Peters, president Long Island Railroad Company; L. C. Weir, president Adams Express Company; Commodore F. G. Bourne, Colgate Hoyt, Jefferson DeMont Thompson, H. K. Burress, W. G. McAdoo of New Jersey Tunnel Company, Anton G. Hodenpyl, A. R. Pardington, Dave Morris, president Automobile Club of America, and Dean Alvord.

The following agreed to serve as incorporators and directors, and sent regrets for being unable to be present: Harry Payne Whitney, Clarence H. Mackay, E. Russell Thomas, W. J. Matheson, John Farson.

In the announcement that followed the meeting this information was included:

The automobile speedway will be on Long Island, and will be open to all drivers of pleasure automobiles. As proposed and decided upon, it will be constructed on a private right of way, with no grade crossings and of sufficient width to insure safety under all conditions. It will be protected by suitable fences and will provide high-class accommodations for motorists. As a toll road it will have numerous feeders, controlled by tollgates allowing

tion of $5,000, wrote as follows to A. R. Pardington: "As the establishment of a course will so greatly benefit manufacturers, it seems proper that they should give the project their financial support. Acting in accordance with this idea, the White Sewing Machine Company will subscribe $5,000 to the stock of the company formed to build the course, and I wish that you would put this formal offer before the committee. I would say, further, that we do not wish to have it understood that we are not prepared to contribute further to this worthy cause."

E. R. Thomas, the Buffalo maker, expressed himself in this vein: "As a manufacturer of automobiles, I regard the establishment of a private course for speed, endurance, and other contests an absolute necessity for the development and perfection of automobiles. The construction of a touring car for public use must, in no sense, be experimental, for the safety of human life is involved, and a great reserve of strength must be had."

A. L. Riker, designer of the Locomobile Company of America, comments in this manner: "The proposed automobile speedway is what the automobile manufacturers have been waiting for for years. It will enable the manufacturers to thoroughly test out both touring and racing cars."

"All of the men who attended the recent meeting were unanimous in favor of Long Island," states Mr. Pardington. "Propositions from New Jersey, New York state, and Connecticut were presented and carefully considered, but Long Island, in view of the new bridges and tunnels giving greater accessibility from New York City, in addition to the projected city boulevard beginning at the Long Island end of the new Blackwell's Island bridge, was deemed far superior to all other proposed sites."

HOW THE AUTOS CHASED THE BALLOONS

PITTSFIELD, MASS., Oct. 22.—Twenty-five minutes after the balloon *Centaur* had landed in Bennington, Vt., an automobile driven by Floyd Knight, of Pittsfield, reached the place of the descent. The *Centaur*, piloted by Charles T. Walsh, who carried with him Major Samuel Rever and Capt. Charles F. Chandler, of the Signal Corps, U. S. A., had been participating in a distance race with *L'Orient*, guided by Leo Stevens, whose com-

CAPT. CHANDLER, MAJOR REBER, PILOT WALSH, OF CENTAUR.

panion was Capt. Homer W. Hedge, president of the Aero Club of America. Stevens continued with *L'Orient* 27 miles farther, descending shortly after 4 o'clock in Jamaica. The *Centaur*, which during its journey had reached a height of 6,200 feet, had discontinued its voyage at 1 o'clock. *L'Orient* ascended 8,000 feet into the air, and the occupants of both balloons found the heat so intense above the clouds that all outside clothing was discarded.

The start was made from Aero Park, in Pittsfield, at about 10:30 A.M., with weather cloudy and a slight breeze from the northeast. The two balloons, with three automobiles that followed, represented all that was left of the contest declared off on Saturday because of unfavorable weather. To-day's event was more or less of a trial contest, the present intention being to hold the event for the Alan R. Hawley cup on Saturday next. Mr. Hawley's cup is known as the Aero-Auto Cup, and is to be awarded to the driver of the automobile who first reaches the descending balloon after it is landed, in any event conducted by the Aero Club of America.

In the basket of the *Centaur* was placed a big map drawn by Major Reber and covering the country around Pittsfield for a radius of 100 miles. It was blocked off in squares, on which Major Reber could record by means of barometer and thermometer the location and rise and fall of the *Centaur*. Food, spring water and stimulants were placed in the baskets of both cars and at the last moment the Stars and Stripes were set on the *Centaur*. A score of men who had it in restraint caught the signal for release. A moment after its upward leap Aeronaut Walsh shouted for assistance. A cry of alarm went up from the crowd as a hundred men rushed forward and clung to the drag rope. Walsh had observed at the start that too much ballast was aboard the *Centaur*, and while the volunteers restrained his craft he lightened her. Again she lifted swiftly and half a minute later *L'Orient* was released.

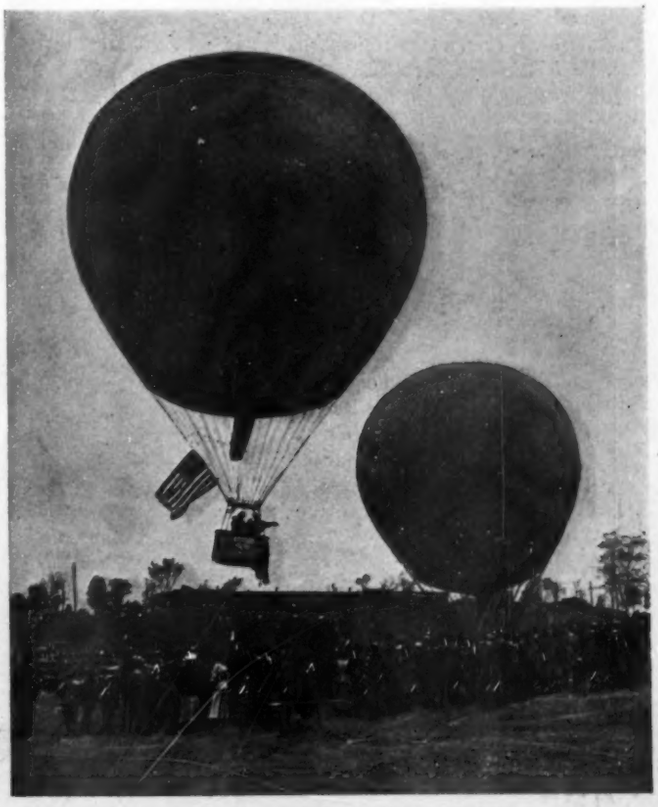
The latter swept toward the *Centaur*, and a collision appeared imminent. Together, they barely escaped the top branches of a tree at the edge of the park, and set a course directly over Pittsfield. The fire bells of Pittsfield sounded as the balloons passed over the town, summoning citizens to the streets and to house-tops.

L'Orient and *Centaur* to-day were pursued by three automobiles —Floyd Knight, driving a 35-horsepower Berkshire; Chauffeur William Archibald, in a Pope-Toledo, and Cortlandt Field Bishop, with his 35-horsepower Panhard. Mr. Bishop was in the lead for the greater part of the way, but, when near Bennington, mechanical troubles put him out of the reckoning.

SANTOS-DUMONT WINS THE $10,000 PRIZE.

PARIS, Oct. 23.—M. Santos-Dumont has won the Deutsch-Archdeacon prize of 50,000 f. ($10,000) promised to the first aerial appliance which, unsupported by gas, should make a circle of at least one kilometer without falling to the ground. The *Bird of Prey*, the name of M. Santos-Dumont's latest creation, is a huge contrivance propelled by a 60-horsepower motor. The flight was from a field at Bagatelle. The morning attempt was unsuccessful. The afternoon trial was made without hesitation. The flying machine, with its motor making 1,500 revolutions a minute, glided into the air and traveled for about 50 meters, when the motor stopped and a somewhat rapid descent was made. M. Santos-Dumont afterwards stated that he cut off the gas owing to an unexpected sideward movement, and did not quite comprehend why he didn't go on. He placed the happening to inexperience, and said that after a few trials he was certain that he would be able to travel many kilometers.

Capt. Felber, a prominent French aeronaut, is quoted in the Paris *Herald* as follows: "So convinced am I that M. Santos-Dumont is on the right lines that I think it absolutely essential that the Wright brothers immediately make public the result of their experiments. Within six months their instrument will have been surpassed in France, and they will find they are too late."



THE CENTAUR (CARRYING FLAG) AND L'ORIENT, STARTING.

PONDEROUS-LOOKING MOTOR OF THE BLERIOT HYDROPLANE.

BLERIOT'S AQUATIC FLYING CRAFT.

PARIS, Oct. 15.—Henry Bleriot, of Paris, a well-known manufacturer of automobile lamps and projectors, applied two years ago for a patent covering a hydroplane craft destined to travel over seas and calm waters. M. Bleriot has slowly tried and improved his invention until on October 12, when he made successful experiments in the d'Enghien Lake, near Paris.

The new Bleriot hydroplane consists of two horizontal structures, each made of a double frame, covered with canvas. The rear structure has a rectangular form rounded at each end. The front structure is perfectly rectangular. The rudder is placed at the exteme aft, and is steered by means of ropes running on pulleys. The apparatus reposes on two floaters. The motor, or rather the two groups of motors, are of the Antoinette type, built by Levavasseur, of Puteaux. The cylinders are working at an angle of 45 degrees, and are very light, which is one of the characteristics of Levavasseur's work. The motors actuate a propeller of two meters diameter placed at the extreme aft of the machine. At the rear of the contrivance, and in the water, revolve two screws, turning in opposite direction, and actioned by the same shaft.

While M. Bleriot's experiments have not been of startling success, he feels much encouraged regarding the value of his idea and believes in its ultimate utility.

THE CHICAGO ECONOMY TEST.

CHICAGO, Oct. 22.—Paul Hoffman, the winner of the recent Algonquin hill climb, Thursday captured the fifty-seven mile gasoline economy test from the New Southern Hotel, of this city, to Cedar Lake, Ind. He drove a 28-32 Pierce Arrow and consumed 2 gallons 23 ounces of gasoline, making 8,378 merit marks. Charles Freidberg, in an Aerocar, was second, using up 2 gallons, 1 quart, and securing 5,834 merit marks. It is highly probable that H. L. Hubbard would have won had his Premier carried a little more weight. He could have carried 200 more pounds without using any more gasoline. The test, which was given under the auspices of the Chicago Motor Club and the Chicago Automobile Trade Association, was the most severe ever given hereabouts, the rain and heavy going making it a real contest. In fact, the conditions could not have been much worse, as the rain fell most of the way, coming down in sheets just before the cars arrived at Crown Point. Most of the motorists remained at Cedar Lake over night, not caring to take the trip back. It is believed by most of those who made the trip that a car which went Thursday twenty-five miles on a gallon of gasoline could ordinarily go thirty miles. The summary:

CAR AND DRIVER	WEIGHT	GASOLINE CONSUMED Gal.	Qt.	Oz.	MERIT MARKS
Pierce, Paul Hoffman	4,675	2	–	23	8,378
Aerocar, Charles Friedberg	3,360	2	1	—	5,834
Premier, H. L. Hubbard	2,640	1	3	4	5,788
Silent Knight, C. Y. Knight	4,225	2	3	—	5,781
Haynes, C. W. Birchwood	3,700	2	2	6	5,674
Pope-Toledo, C. Schoeneck	2,720	1	3	26	5,440
Rambler, C. S. Neuman	3,900	3	–	—	5,078
Apperson, C. Van Sicklen	4,750	4	2	27	5,000
Berliet, Walden Shaw	3,925	3	–	17	4,894
Simplex, B. C. Hamilton	4,000	3	1	26	4,524
Reo, Otto Owen	1,960	1	3	—	4,278
Franklin, O. K. Wight	2,150	1	3	29	4,249
Buick, D. C. Case	2,925	2	2	25	4,320
Frayer-Miller, Jerry Ellis	3,620	3	2	—	4,040
Cadillac, G. Farnsworth	1,875	1	3	25	3,757
Queen, H. P. Branstetter	3,750	4	1	—	3,459
Stoddard-Dayton, J. H. McDuffee	3,350	3	3	22	3,336
Elmore, T. Gorham	3,560	4	1	—	3,224
Rambler, J. F. Gunther	4,150	6	–	—	2,700
Rambler, T. B. Jeffery	3,750	6½	–	—	2,343

According to the formula the heavier cars got the better positions on account of more weight to the gallon of fuel. Scores were determined by dividing weight by amount of fuel used.

HENRY BLERIOT TRYING OUT HIS PONDEROUS HYDROPLANE CRAFT ON THE D'ENGHIEN LAKE NEAR PARIS.

FUTURE ROAD RACING IN FRANCE

By W. F. BRADLEY.

PARIS, Oct. 12.—The Vanderbilt Cup contest closed the world's automobile racing season for 1906, and opened a fierce discussion on French plans for next year. A certain section would have the A. C. F. abandon road racing entirely and devote itself to touring and endurance contests. Although ably led by the Marquis de Dion, this body is in the minority, and there is very little probability of its being able to convert the majority to its way of thinking. The expense of racing, the freak monsters which it has produced, the attainment of a maximum speed under present tire and road conditions, the danger to drivers and the public, are the stock arguments brought forth, to be met with the equally stereotyped claims that speed alone can test the power of a machine, that touring contests are imperfect, and that racing is the sole means of interesting the public in motoring.

One strong argument of the racing section is that if France does not hold a road race the exciting foreign contests will increase in importance—it is not for a moment supposed that French firms would abstain from outside speed tests—to the advantage of America, Italy, and Belgium.

Apart from the primary question, "Shall we race?" two other questions of no less importance have presented themselves: "Under what regulations shall racers be built?" and "Who shall pay for the organization of the contests?" It is maintained that the present regulation fixing a weight limit of 1,000 kilos, and leaving builders free in every other respect, has produced wonderful improvements in metallurgy, but few in the motor. The maximum of speed has been maintained, but the increase of horsepower is totally disproportionate to the increased rate of travel.

Most French constructors are of opinion that cylinder capacity should be limited, and that a minimum weight should be imposed. Some propose a limited cylinder bore; others are in favor of fixing a limit to cylinder capacity (bore and stroke), while a few would adopt the British Tourist Trophy method of restricted fuel consumption. Being a three-cornered fight, there is always a possibility of the existing regulation remaining for next year, owing to the impossibility of engineers coming to a unanimous decision on stroke or cylinder volume.

Dismountable rims are also being attacked, on the ground that they do nothing towards the improvement of tires, and it is quite possible that their use will be forbidden in next year's race.

The question of finance is one which appeals almost exclusively to the Automobile Club of France. A deficit of $15,000 remained after the Grand Prix; in three years $240,000 have been spent in organizing road races, and altogether no less than $400,000 have been expended by the club on speed contests. The committee would like to transfer more of this responsibility to the manufacturers, urging that they get all the benefit of racing in increased business. Automobile builders are not of the same opinion, and claim that as the club takes all the profit of the Salon, it ought to bear the loss of races. Charges of extravagance, too, are brought forth, the luxurious decorations and fittings on the Sarthe Circuit being declared quite unnecessary.

The system of choosing a fresh circuit each year is exceedingly costly, as is proven by the fact that despite an expenditure of $400,000, the club has not an inch of road in racing condition, and does not own a single plank of its many handsome grand stands. If a permanent course were chosen, an annual expenditure of $20,000 would be ample to put it in annual racing trim, and this amount would be more than secured by entrance fees, public admissions, and incidental sources.

A discussion of the present situation took place at the club this week. First, the sporting committee met, and, although in favor of continuing the annual race, decided to submit the question to the club committee. When this body met, M. Renè de Knyff, as chairman of the sporting committee, proposed that the regulations for next year's race should be discussed. Marquis de Dion took objection, and endeavored to persuade the club to abandon racing. M. Brasier joined with the head of the Panhard firm in advocating the claims of speed, and a lively discussion followed. Finally it was decided to submit the question to the manufacturers themselves in the shape of the Chambre Syndicate de l'Automobile (construction section). Curiously, the Marquis de Dion is the president of this body. He declares, however, that he will bring the subject before his society, and, although personally opposed to racing, will work with the majority if it is decided to hold a race. When his own touring schemes are brought forth, the Marquis expects equal support from the racing men. After the constructors have given their opinion, the club committee will immediately meet and make full arrangements for next year.

It is generally thought in Paris that the constructors will vote in favor of a race, as they did last year under simliar circumstances, and that the sporting committee will recommend a very short circuit, limitation of cylinder capacity, and a minimum chassis weight of 1,200 kilos.

BUFFALO HAS 1907 CUP COURSE.

BUFFALO, Oct. 22.—Vanderbilt Cup Race, Buffalo, 1907! That is the slogan that has been started by the members of the Automobile Club of Buffalo. The other afternoon President H. A. Meldrum and Secretary D. H. Lewis went out for the purpose of selecting such a course as is required for a race of the Vanderbilt Cup character. The course selected commences at the four corners of the Transit road and Main street, two miles and one-half beyond Williamsville; then direct east of Main road, through Sturnerville and Clarence to the first four corners beyond Grant Club, which is known as Murrays Corners, which is eleven and one-half miles of the very finest macadamized road. At this point there is a turn to the right and a course over a good, average dirt road to Crittenden, 3.8 miles, then a turn direct west of the Genesee road through Mill Grove and Bowmansville to the Transit road, 11.2 miles; then a sharp turn on the Transit road back to the Main road, 1.8 miles, making a total of 28.3 miles. There are only two railroad crossings on the course. The course is an ideal one in every respect.

PARTS WHICH HAVE SEIZED.

"It often happens in automobile mechanics," says *Omnia*, "that small parts not frequently moved and which have been neglected become bound. Distance rods may be cited as an example, but the same thing applies to any part passing over another by friction, a nut on a bolt for instance. To disengage them, force is useless. Gentleness should be employed.

"First of all, cover the bound pieces with oil or kerosene and leave them for an hour or two for the oil to penetrate. If the parts still bind, take them to the fire and treat them to 45 or 50 degrees centigrade (so hot that they cannot be held in the hand, but not so hot as to give the sensation of a severe burn); then throw them into some vessel containing kerosene and leave them until cold. The heating opens the pores of the metal and facilitates the penetration of the liquid. Few people have any idea of the subtlety of kerosene. This liquid will finally work itself between metal surfaces most tightly bound together."

An attempt is being made in Paris to organize a parade of old cars, which, if carried out, should prove highly interesting. Those who are known to have old vehicles in their possession are being asked to take part in this demonstration, which will probably consist of a run from the Place de la Concorde to Versailles, with the climb up the Suresnes hill.

LIST OF EXHIBITORS OF THE A. C. A. SHOW.

TWO hundred and thirty exhibitors, including 94 makers of complete cars and 136 manufacturers of accessories, will be included in the seventh show conducted under the auspices of the Automobile Club of America, this time to be held from December 1 to 8 in the Grand Central Palace, Lexington avenue and Forty-third street, New York City.

The earlier date apparently has met with decided approval, for there were 266 applications, and the show committee of the club, declining to cut down the spaces, was compelled to refuse 36 intending exhibitors. While more than 55,000 square feet was available in the exhibition hall and galleries of the Palace, the total space applied for was 66,000 square feet.

The American Motor Car Manufacturers' Association, possessing a membership of 38 manufacturers; the importers of 18 foreign cars, and 38 other American manufacturers, is the division of complete vehicle exhibitors.

The whole of the main floor and part of the gallery floor, as indicated by the plans, will be devoted to the exhibition of automobiles. The main gallery, the Lexington avenue front, the Forty-third street side of the gallery floor, and the Lexington avenue end of the visitors' gallery on the third floor, will be devoted to the exhibits of parts and accessories. To insure uniformity, decorations and signs for all exhibition spaces will be furnished by the official decorator, at a special rate to exhibitors.

The show will open Saturday, December 1, at 8 P.M., and each and every day thereafter from 10 A.M. to 11 P.M., until and including Saturday evening, December 8 (Sunday excepted).

Bureaus of registration and information will be established, and in the case of the latter bureau a representative of the management will be located for three days prior to the show's opening in the main lobby, where information on any matter may be obtained.

Exhibits will be received at the Palace, Forty-third street entrance, on and after Wednesday, November 28. It is expected that all exhibitors will arrange their stands on Friday and Saturday, and have their exhibits ready for the private view to the members of the Automobile Club of America and their guests at 3 P.M. on Saturday, and for the public by 6 P.M. on the same day. No exhibits will be received after the latter hour.

The list of exhibitors is as follows:

AUTOMOBILES—DOMESTIC.

Abendroth & Root Mfg. Co.
American Motor Wheel & Auto Co.
American Motor Truck Co.
Berkshire Automobile Co.
Commercial Truck Co. of America.
Daimler Mfg. Co.
Deere-Clark Motor Car Co.
Detroit Automobile Mfg. Co.
Hendee Manufacturing Co.
Jeffery & Co., Thos. B.
Lane Motor Vehicle Co.
Oscar Lear Automobile Co.
Maumee Motor Car Works.
Pennsylvania Auto Motor Co.
Reading Standard Cycle Mfg. Co.
Shawmut Motor Co.
Wagner Motor Cycle Co.
White Sewing Machine Co.
Zimrock Motor Car Co.
American Locomotive Auto Co.
American Motor Co.
Auto Car Equipment Co.
Cleveland Motor Car Co.
Curtis Mfg. Co., G. H.
Dayton Motor Car Co.
E. H. V. Company.
Grout Bros. Automobile Co.
Holsman Automobile Co.
Johnson Service Co.
Lansden Co., The.
Logan Construction Co.
Moore Automobile Co.
Quinby & Co., J. M.
Rainier Co.
Torbensen Motor Car Co.
Welch Motor Car Co.
Woods Motor Vehicle Co.

AUTOMOBILES—FOREIGN.

Argus Import Co.
Bousquet & Cie. (Bianchi).
Cryder & Co.
E. B. Gallaher (F. Brasier).
Itala Import Co.
Napier Motor Co. of America.
Palmer & Christie.
Renault Frères Selling Branch.
E. W. Sutphen (English Daimler).
R. Bertelli & Co. (Zust).
Charron, Girardot & Voigt.
Delahaye & Pilain Agency.
Hartford Suspension Co. (Gobron Brillie).
Mercedes Import Co.
Palais de l'Automobile.
Panhard & Levassor.
Rossell Co. of America.
Société Anonyme Westinghouse.

AUTOMOBILES—MEMBERS A. M. C. M. A.

Acme Motor Car Co.
American Machine Co.
Austin Automobile Co.
Aerocar Co.
American Motor Car Co.
Bartholomew Co.
B L M Motor & Equipment Co.
Conover Auto Co.
De Luxe Motor Car Co.
Dolson Auto Co.
Dragon Automobile Co.
Evansville Automobile Co.
Harrison Wagon Co.
Knox Motor Truck Co.
Maxwell-Briscoe Motor Car Co.
Moline Auto Co.
Mora Motor Car Co.
National Motor Vehicle Co.
Pierce Engine Co.
St. Louis Motor Car Co.
Triumph Motor Car Co.
Premier Motor Car Co.
Buckeye Mfg. Co.
Crawford Auto Co.
Detroit Auto Vehicle Co.
Dorris Motor Car Co.
Duryea Power Co.
Ford Motor Co.
Jackson Automobile Co.
Marion Motor Car Co.
Mitchell Motor Car Co.
Moon Motor Car Co.
Motor Car Co.
Nordyke & Marmon.
Rapid Motor Vehicle Co.
St. Louis Car Co.
Wayne Auto Co.
Reo Motor Car Co.

ACCESSORY EXHIBITORS.

Ajax-Grieb Rubber Co.
Aster Co.
Robert Bosch.
Chicago Flexible Shaft Co.
Elbridge Electric Mfg. Co.
Electric Rubber Mfg. Co.
General Electric Co.
Harburg Tire Co.
Hicks Speed Indicator Co.
Lavalette & Co.
Miller, Chas. E.
Mills Manufacturing Co.
Never-Miss Spark Plug Co.
Post & Lester Co.
Scandinavian Fur & Leather Co.
Survey Map Co.
Wm. Vogel Brothers.
American Generator Co.
Auto Cabinet Co.
Carbondale Chemical Co.
Continental Caoutchouc Co.
Ehret Tire & Tool Receptacle for Auto.
Electric Storage Battery Co.
Gould Storage Battery Co.
Haws, George A.
Hill Mfg. Co.
Michelin Products Selling Co.
Miller's Sons, W. P.
Model Gas Engine Works.
Pittsfield Spark Coil Co.
Prosser & Sons, Thos.
St. John Rubber Tire Mfg. Co.
Tire Safety Device Co.
Willis Co., E. J.

ACCESSORY EXHIBITORS—MEMBERS OF M. C. & A. M., INC.

American & British Mfg. Co.
American Elect. Novelty Mfg. Co.
Atwood Mfg. Co.
Auto Coil Co.
Badger Brass Mfg. Co.
Briscoe Mfg. Co.
W. H. Brown.
Byrne-Kingston Co.
Consolidate Mfg. Co.
Dayton Electrical Mfg. Co.
Detroit Lubricator Co.
Diamond Chain Mfg. Co.
Diezeman Shock Absorber Co.
Eastern Carbon Works.
Firestone Tire & Rubber Co.
Gabriel Horn Co.
Gilbert Mfg. Co.
Goodrich Co., B. F.
Gray & Davis.
Ham Mfg. Co.
Hartford Auto Parts Co.
Hartford Suspension Co.
Herz Co.
Hyatt Roller Bearing Co.
Jones Speedometer Co.
Kinsey Mfg. Co.
Lipman Mfg. Co.
Midgeley Mfg. Co.
McGlehan Mfg. Co.
Motor Car Specialty Co.
National Carbon Co.
Oliver Instrument Co.
Pennsylvania Rubber Co.
Rands Mfg. Co.
Rose Mfg. Co.
Schwarz Wheel Co.
Smith Mfg. Co., R. H.
Splitdorf Co., C. F.
Standard Welding Co.
Timken Roller Bearing Axle Co.
Uncas Specialty Co.
Warner Gear Co.
Webb Co.
American Ball Bearing Co.
Atwater Kent Mfg. Co.
Aurora Automatic Machine Co.
Avery Portable Lighting Co.
Baldwin Chain Mfg. Co.
Bowser Co., S. F., Inc.
Brown-Lipe Gear Co.
Conn. Tel. & Elect. Co.
Cramp's Sons Ship & Engine Bldg. Co.
R. E. Dietz.
Detroit Motor Car Supply Co.
Diamond Rubber Co.
Dixon Crucible Co.
Edmunds & Jones Mfg. Co.
Fisk Rubber Co.
Gemmar Engine Co.
G & J Tire Co.
Goodyear Tire & Rubber Co.
Gray Hawley Mfg. Co.
Harris Oil Co., A. W.
Hartford Rubber Works.
Heinze Electric Co.
Hess-Bright Mfg. Co.
International Rubber Co.
Kilgore Auto Air Cushion Co.
Light Mfg. & Fdy. Co.
Manufacturers' Fdy. Co.
McCord & Co.
Morgan & Wright.
Muncie Auto Parts Co.
N. Y. & N. J. Lubricants Co.
Oliver Mfg. Co.
Prest-O-Lite Co.
Robinson & Sons, W. C.
Sager Co., J. H.
Shelby Steel Tube Co.
Spicer Universal Joint Mfg. Co.
Sprague Umbrella Co.
Swinehart Clincher Tire & Rubber Co.
Turner & Fish Co.
Veeder Mfg. Co.
Warner Instrument Co.
F. H. Wheeler.

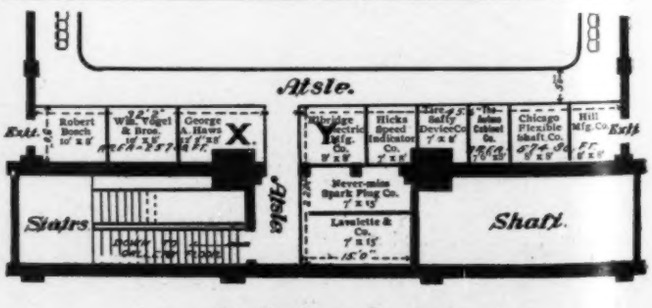
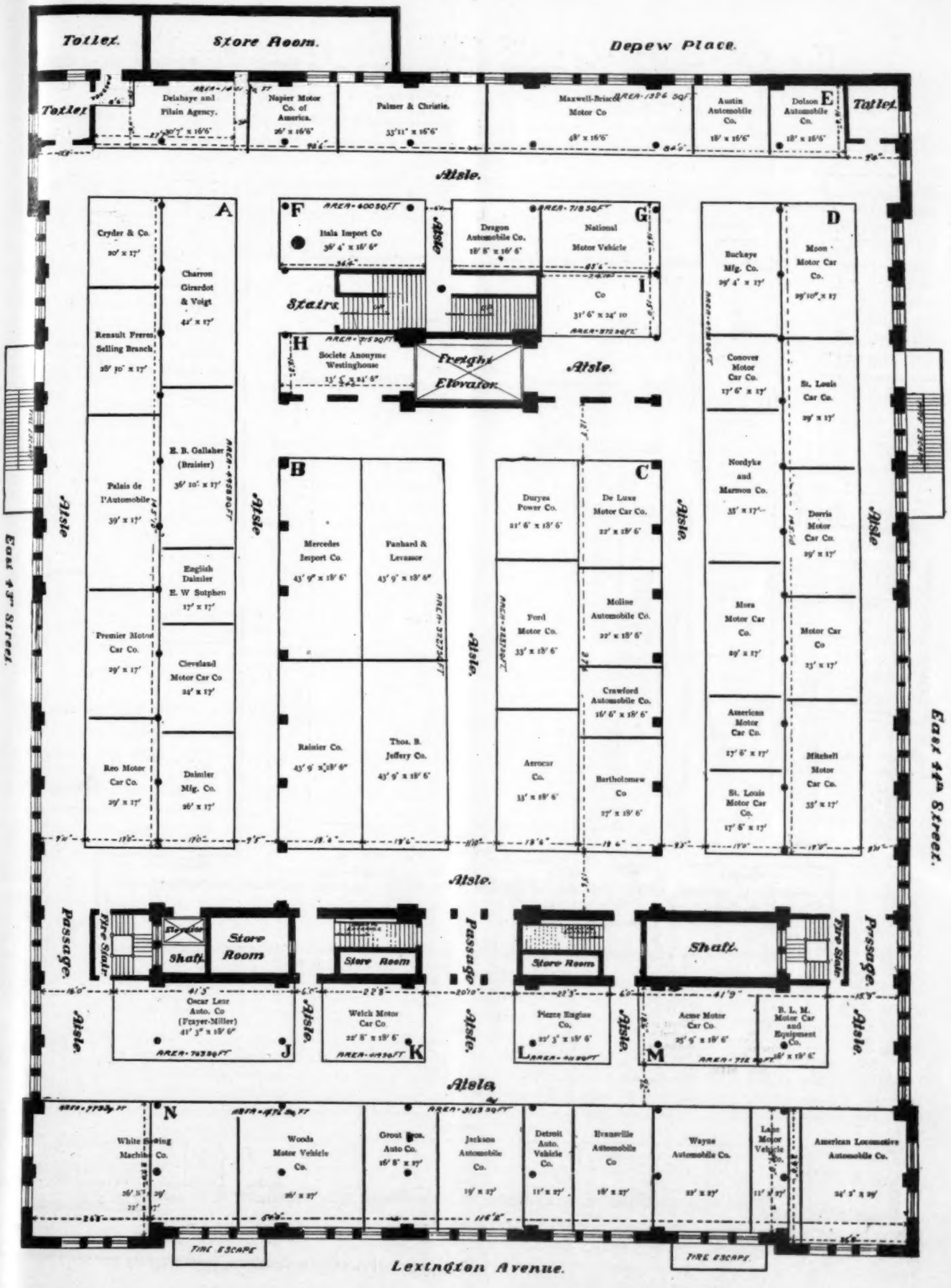
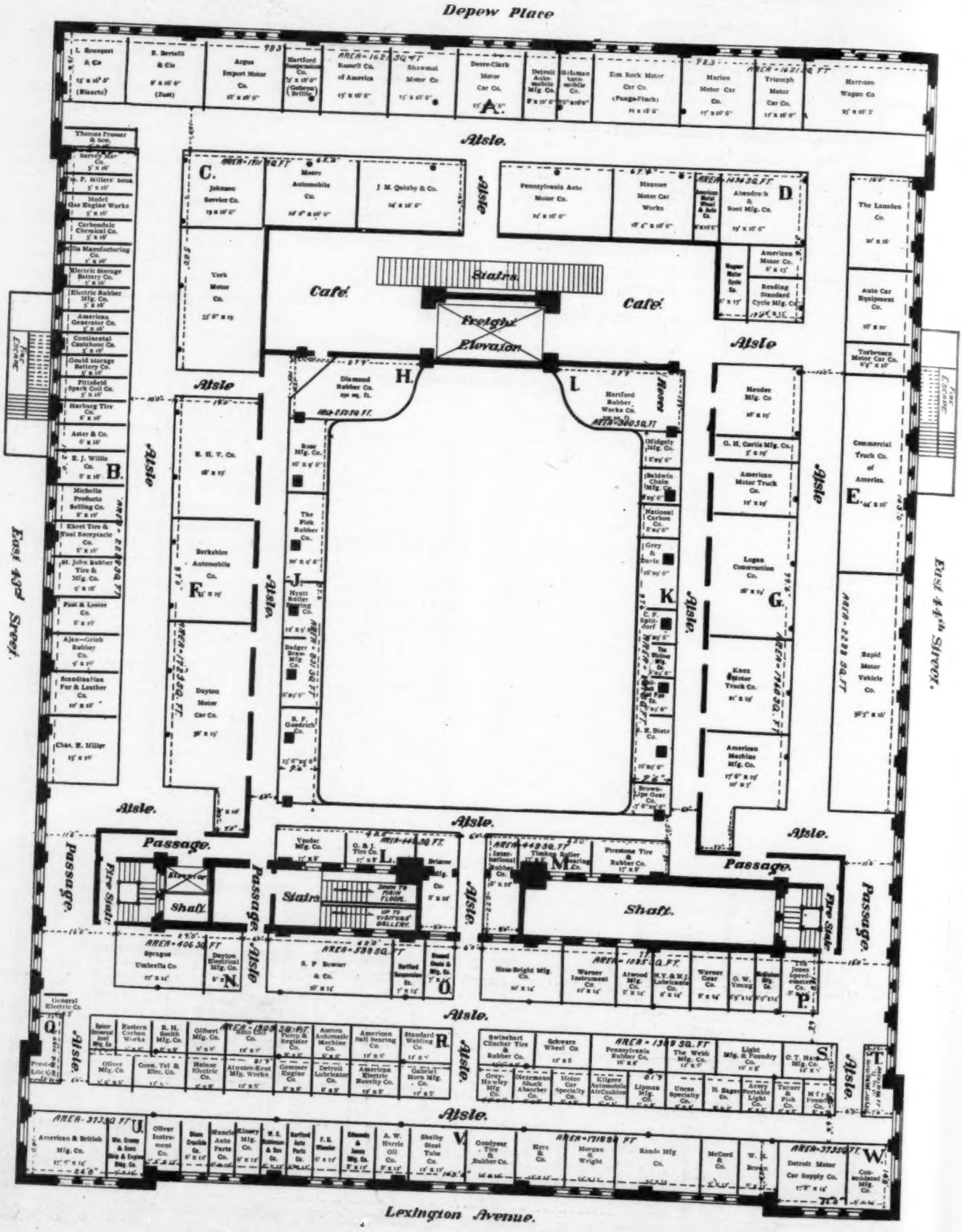


DIAGRAM OF VISITORS' GALLERY, THIRD FLOOR.



THE MAIN FLOOR PLAN OF THE GRAND CENTRAL PALACE FOR THE DECEMBER SHOW.



THE GALLERY FLOOR PLAN OF THE GRAND CENTRAL PALACE FOR THE DECEMBER SHOW.

THE DIAGNOSIS OF MOTOR TROUBLES

By HAROLD H. BROWN.

WHEN multi-cylinder engines were introduced into this country one of the most common arguments against their use was that as there were practically in the case of a four-cylinder motor four times as many parts, there must be four times as much trouble, and this trouble must be four times as hard to find. Fortunately, however, experience has proved the falsity of this argument, and it may be said that if a few fundamental facts are understood, it is much easier to locate troubles in a four-cylinder than in a single-cylinder motor.

First: Find if the Trouble Is Confined to One Cylinder.

The most important fact to be borne in mind is that if the trouble is wholly confined to one cylinder, we can rest assured that the carbureter is functioning properly, the batteries, the lead wires from battery to coils and from battery to ground are all right and the trouble must lie either in the individual ignition of that cylinder or the valve setting or loss of compression.

The simplest way to locate the cylinder which is not functioning properly is to cut off the ignition from the cylinders until the offender is found. This is best done with the jump-spark system and individual coil by holding down the tremblers. Some foreign coils, however, are provided with buttons for grounding the secondary wires. In case a single coil and distributer system is used the ignition of each cylinder should be grounded; or in case a "Safety Spark Gap" is provided, the wire may be disconnected from its individual plug. This practice is not as a general thing to be recommended, for even with the safety gap an undue strain is put on the coil, which may in time break down its insulation. In case of low-tension ignition the igniter is simply disconnected from the source of current.

The Sounds of a Motor and What They Indicate.

If trouble in the running of a motor is confined to one cylinder, then this defect will occur at regular intervals or multiples of regular intervals, be the trouble either a weakened explosion, due to improper valve setting, or weakened explosions coupled with occasional missing due to faulty ignition. The sound, though hard to describe, is unmistakable and can easily be learned by cutting out the ignition of one cylinder of a motor which is known to be working properly and noting the difference in the sound of its running. No matter how well adjusted a motor may be, there is almost always a slight difference in the sound of each cylinder and an expert can almost always tell by the sound the number of cylinders of a motor which is out of his sight if not out of his hearing. For the novice, however, the most certain method is to cut out the ignition from the cylinders successively until the trouble is found.

One method of procedure is to cut out the first and fourth cylinders; if now both the second and third seem to be working well, then put first and fourth in operation and cut out second and third, then cut out fourth, and then we have either located the trouble or found that it is not confined to one cylinder. Still another method would be to cut out first and second and then second and third; in this latter case two explosions follow each other, followed by two intervals of silence; it would therefore be possible in this case, knowing the order of firing, to locate the defective cylinder of a pair by sound. For instance, the common order of firing is 1, 3, 4, 2.† Now, if we cut out 1 and 2, then if the first of the pair of explosions is weak or skips three will be the defective cylinder. If, however, we cut out three and four and the first explosion in this case is the defective one, then two is the defective cylinder; this may be a little confusing at first, but will be plain if we repeat the order of explosions twice.

Thus:

1 (3, 4) 2, 1 (3, 4) 2, 1 (3, 4) 2, 1.

It is possible in a good many cases to locate the defective cylinder by the sound if only one cylinder is cut out; for instance, suppose we cut out 1, and let us denote the defective cylinder by a star underneath.

First Case, one the defective cylinder.

(1) 3, 4, 2 (1) 3, 4, 2. One cut out.
* *

In this case the rhythm is undisturbed, although if it has simply been a case of occasional missing, then the three explosions stand out much more clearly, as it were.

Second Case, two defective. One still cut out.

(1) 3, 4, 2(1) 3, 4, 2.
* *

This gives us two strong explosions followed by two intervals of silence, or in the case of occasional or weak explosion this *follows* the regular double beat.

Third Case, three defective. One still cut out.

(1) 3, 4, 2 (1) 3, 4, 2.
* *

In this case, as in two, we have two strong explosions followed by two intervals of silence. However, if three only occasionally skips or is weak, this weak explosion will *precede* the strong ones

Fourth Case, four defective. One still cut out.

(1) 3, 4, 2 (1) 3, 4, 2.
* *

In this case the strong explosions will be equally spaced, but if a weakened explosion occurs occasionally it will be between the two regular ones. If we are undecided between case two and three, then cut out two instead of one; and if case two, we have three explosions together, and if case three, we have equally spaced explosions.

Thus,

Case Two, 1, 3, 4 (2), 1. 3, 4 (2).
* *

Case Three, 1, 3, 4 (2), 1, 3, 4 (2).
* *

While at first this method of detecting the defective cylinder by the ear may seem difficult, a little practice will show that it is comparatively easy; in fact, it requires nowhere near the skill employed by a physician in using the stethoscope in ascertaining the action of the heart.

To practice this method get a friend to cut out the ignition of one cylinder, then call upon him to cut out, let us say, one and, if necessary, two and try to name the cylinder whose ignition he has first cut out. First, however, ascertain the order of firing of the cylinders.

In the case of a leaky inlet valve the trouble seems to be general, although confined to one cylinder. In this case the exploded gases escape into the inlet pipe on the working stroke, causing weak mixture and signs of irregular carburetion, such as inlet pipe explosions, explosions in the cylinders weak and irregular. In this case cut out the cylinders successively and when the defective one is found the trouble will disappear.

In case we have located the trouble in one cylinder, then we can rest assured that the trouble is with the ignition or is due to valve troubles, insufficient lift or poor compression. Valve troubles and poor compression are denoted by regular but weak explosions. Look to amount of valve lift and try compression by turning the motor over by hand. Regular but weakened explosions may also be caused by the ignition timing of that particular cylinders being out of synchronism; this, however, is extremely unlikely except with low-tension ignition.

†Note.—It is customary to number the cylinders from front to rear, No. 1 being the front cylinder and No. 4 the rear. The coils are placed in the same order on the dash from left to right, the coil of No. 1 to the extreme left and that of No. 4 to the extreme right.

If the cylinder misses but the explosions seem to be of equal strength, the trouble is with the ignition and is most likely a dirty spark plug. The remedy in this case is obvious. If this does not cure the trouble and we are reasonably sure our plug is all right, then the next place to look for trouble is in the coil adjustment. If the machine is fitted with a multiple unit coil and it can be done with facility, it might be as well to shift coils if not sure about the adjustment. Of course the trouble may be in the wiring, but this is rather unlikely nowadays. If the vibrator works regularly the primary circuit is all right.

Weak exhaust valve springs give symptoms almost identical with faulty ignition; that is, missed explosions. The trouble is, however, much more pronounced at high speeds and may disappear at low and moderate speeds. On the other hand, defective ignition is likely to be fully as much in evidence at low as at high speeds, and in the case of low speeds and a heavy load to be much more pronounced. Furthermore, weak exhaust valve springs give weakened explosions before missing begins.

If Trouble Is Not Confined to One Cylinder.

If we are assured that the trouble is not confined to one cylinder, then we can reasonably be sure that the trouble is either weak batteries or poor carburetion. As a general rule weak batteries give missed explosions, but the explosions that occur are likely to be of uniform strength.

Poor carburetion on the other hand gives explosions of varying strength, coupled with missed explosions. Another general rule is that muffler explosions denote ignition troubles, whereas inlet pipe explosions denote a weakened mixture and carbureter troubles.

If the trouble is due to weak batteries, then changing over to the reserve set will improve the running even if the reserve set is pretty low, for either storage or dry batteries pick up more or less after a rest. Of course the best course is to test the batteries if a volt or ampere meter is at hand.

Testing the Ignition Batteries.

Perhaps a few words on battery testing might not be amiss. In case one uses a storage battery it is well to have a volt meter large enough to test the battery as a whole; that is, for a two-cell battery one should have a meter reading to five volts, and for a three-cell one reading at least to seven volts. To test a battery it is, in most cases, unnecessary to open the battery-box. A test can generally be made by placing one terminal of the meter on the point of the switch, usually located on the coil-box, which is connected to the battery to be tested, and the other to any convenient "ground," as, for instance, the sight-feed oiler or the steering column. In the case of certain makes of plug switches whose points are covered in the switch on the battery to be tested, note the coil which buzzes and place the terminals of the meter across the vibrator and hold it down, when a reading can be taken. (The resistance of the coil will not affect the reading of a good pocket voltmeter.) That is on vibrator screw support and on vibrator support. The binding screws on the bottom of the coil-box are, in most cases, fairly accessible, and we may make our test at this point. In the case of dry batteries and an ampere meter the reading at the coil and at the battery-box may differ slightly, but we can still get a fair idea of the condition of the batteries, which is all that we require.

Carbureter Troubles.

If we fail to locate the trouble with our ignition, then we must look to our carbureter. Overrich mixture gives us a strong smelling exhaust and formerly caused general ignition troubles; fortunately, however, owing to improvement in the design of plugs, an overrich mixture has very little effect on the ignition. Weakened mixtures, as has been said before, cause inlet pipe explosions. Two sources of trouble with carbureters which were formerly very much in evidence have largely disappeared. These are water in the gasoline and partial stoppage of the gasoline supply. The symptom of the former is great irregularity in the strength of the explosions, coupled with missed explosions, which may cause the total shutdown of the motor.

The remedy is to drain the carbureter; and in some cases it may be necessary to drain the whole system. Fortunately, however, owing to the care which is generally exercised in filling gasoline tanks, and also to the use of water traps, which may be separate appliances or incorporated into the design of carbureters, this trouble is largely a thing of the past.

Partial or total stoppage of the gasoline supply is caused either by the gasoline strainer at the carbureter becoming clogged or failure of the gasoline supply, owing to there being insufficient pressure in the tank, in the case of pressure feed, or owing to the tank being air bound in the case of gravity feed. The motor generally starts up strong and then gradually weakens and comes to a stop; if we now prime the carbureter we get no flooding.

Trouble with an air-bound gravity feed tank generally occurs only in cold weather.

Signs of a weak mixture (popping in the inlet pipe) may be caused by various minor derangements of the carbureter. For instance, if furnished with the ordinary suction-operated automatic air valve of the poppet type, the spring sometimes works loose. If, on the other hand, the valve is furnished with a dash pot, as in the Pierce and Panhard carbureters, the action may be somewhat sluggish, and upon the motor slowing down the air port may not close quite quickly enough to adapt the carbureter to the reduced motor speed. On the other hand, in carbureters of the Mercedes type, in which the opening of the throttle also opens an auxiliary air port, a too sudden opening may cause a weakened mixture. It is therefore a good plan to open and close the throttle of a motor slowly.

In conclusion it may be said that the secret of a smooth-running motor is "synchronism." All the inlet valves should open and close at the same point in the stroke of their respective cylinders, as should the exhaust valves. This applies with equal force to the ignition. Since most camshafts are now made solid and pinned to their respective gear wheels, all that is necessary to secure synchronism is to see that the clearance between the valve stem and its push rod is the same in all cases; this clearance is generally about one-sixty-fourth of an inch.

Of course in looking for trouble in a gasoline motor one should, above all things, use common sense. For instance, if we got a motor which we felt pretty reasonably certain was generally out of adjustment, unequal clearance of valve stems, coils out of adjustment, etc., it would of course be foolish to say, because we could not confine the trouble to any one cylinder, that the trouble lay with the carbureter. The subject of valve setting has not been dwelt upon for the reason that as a whole it is extremely unlikely that the valves will get out of time owing to the fact that camshafts are generally made in one piece and pinned to their gears.

In case a cylinder is put out of commission beyond hope of repair on the road it is advisable, if it can be done with facility, to remove the exhaust valve in order to relieve the compression, but never open the relief cock alone for this purpose, as this adds to the drag instead of lessening it. The inlet valve if possible should be kept closed and the ignition cut off. It is of the utmost importance that the inlet valve should be tight on a defective cylinder, hence one should always be supplied with inlet valve parts, as a defective inlet valve affects the working off all the other cylinders.

GLOBE GIRDLER GLIDDEN TO RESUME NOV. 1.

Charles J. Glidden, in company with Mrs. Glidden, will resume his globe girdling on November 1, starting from Boston for Washington, and thence to Chicago, where he will take to the railroad rails, with Mexico City as the destination. Mr. Glidden has accumulated a mileage of 33,600, made in thirty-five countries. The Mexican trip may be extended to Vera Cruz, from which point steamer would then be taken for Egypt to resume the round-the-world journey.

DEVELOPMENT OF THE TWO-CYCLE GAS ENGINE

By C. P. MALCOLM.

TO the mechanical engineer, who is thoroughly conversant with the scientific principles underlying successful gas engine practice and with the reasons for the two-cycle not performing the real functions of a gas engine as well as a four-cylinder does, there can be no reasonable question but what the two-cycle is now in process of a development that will in all probability place it far in advance of the four-cycle for all purposes where the greatest power for the least bulk and weight, and also the least liability to get out of order, are matters of paramount importance; such, for instance, as aerial navigation and in a slightly less degree automobile propulsion.

For at least fifteen or twenty years there has been more or less inventive genius spent upon two-cycle engines without very much improving their manifest defects, principally for the reason that many of those attempting the task have been improvers rather than men of original thought, and seem to have failed to search deep for the cause of the defects and then for an adequate remedy for them.

A Brief History of Two-cycle Development.

Among the first gas engines that we have any knowledge of as being put on the market was a double-acting two-cycle, or more properly speaking, a one-cycle engine; that is, it operated like a steam engine, upon both ends of the piston, and had two power impulses each revolution. The charge was compressed by an air pump and admitted into the cylinder like steam; like steam the compressed charge propelled the piston 20 to 25 per cent. of the stroke, when the charge was exploded by an electric spark and the real power of the engine obtained during the remaining 75 to 80 per cent. Those who have regulated the power and speed of an engine by using a late spark can readily appreciate one reason why such an engine would not give satisfactory results; but it was a great improvement over the original, which operated in the same way, except that it sucked in the charge during the first third of the stroke and of course exploded the charge at slightly below atmospheric pressure, consequently obtaining less than 75 pounds initial pressure. The value of compression was soon recognized, and Otto, after one or more rather impractical machines, finally brought out the four-cycle—which combined the two in a measure—by using a single cylinder, first as an air pump to draw in and compress the charge, then as a power cylinder to explode the charge in and then to expel about two-thirds of the exhaust. Except for the complication of jerk-motioned valves, it was a step in advance toward simplicity and added much to the efficiency by permitting ignition to take place at the proper point to allow time for combustion to spread throughout the entire mass of compressed charge, sufficiently to attain its maximum pressure before the piston commenced or had proceeded far upon its power stroke. By using only one end of the cylinder it avoided the complications inseparable from any attempt to carry a piston rod, operating in gases heated to a white heat, out through an air-tight stuffing box, as the piston rod would very quickly get red hot unless it had an internal circulation of water throughout its entire length. Its disadvantages were that the engine had to be about four times as large for the same power and have a balance wheel about sixteen times as heavy to get the same steadiness of motion, and the fresh charge had from 25 to 30 per cent. more of the exhaust mixed with it. In spite of these great drawbacks, it was very much the superior engine, and in time displaced the other, and until recently has been universally acknowledged to be the best and most economical type of gas engine for general purposes.

We give this very brief history of the different stages of the development of the gas engine for the reason that the advent of the automobile has made an imperative demand for the lightest, most compact, and the most reliable motive power that can be produced, and thousands of both capable and incapable inventors and improvers are working to bring out something better than the gas engines now in use.

What the Two-cycle Engine Attempts to Do.

Whatever the future may have in store for us in the way of a turbine gas engine, and from our present viewpoint it seems that the difficulties in the way of a practicable engine of that type are insurmountable, the cylinder and piston gas engine cannot depart radically from the present practice; a piston rod in the combustion chamber, as we have seen, is so objectionable that it is really impracticable, and we must confine ourselves to using only one end of the cylinder for explosions, and so the best that we can expect is a two-cycle engine. The ordinary two-cycle is an attempt to utilize the other end of the piston as the air pump, and thus double the capacity of the engine, and incidentally to simplify and strengthen the mechanism by dispensing with the jerk-motion valves of the four-cycle, its weakest points and the parts that add complication, and wear out of adjustment and deteriorate rapidly in high-speed engines. That the ordinary two-cycle, as universally designed at present, does not double the power of the engine or perform the functions of a gas engine as perfectly as a four-cycle, is conceded by the well informed of its most ardent advocates. As the reason for this failure is in a large measure due to the lack of intelligent thought and care in designing the several parts so that they will actually perform their functions instead of only partially perform them, we will (before taking up the study of the different types of two-cycle engines) show improvements in designs of parts and methods in the ordinary two-cycle that will, in a large measure at least, overcome the difficulties and make it the superior engine.

Three Problems That Have Proved Difficult.

As pointed out previously in the columns of this paper, the reasons why the two-cycle does not perform the functions of a gas engine as perfectly as, nor develop twice the power of a four-cycle, are:

First, it does not get as full a charge;

Second, its method of expelling the exhaust by means of the fresh charge, instead of by positive mechanism, has drawbacks which have not been overcome so completely but what there is considerable of the exhaust mixed with the charge throughout (as well as being badly mixed on the boundary line between the two), and frequently we find that this action is so bad that some of the charge escapes with the exhaust that it is mixed with;

Third, it has no means of locating what pure charge there might be in the cylinder as definitely as a four-cycle has, so that when small charges are admitted (as when the engine is running light) what pure charge there is will be in contact with the spark plug or point of ignition, after compression. For this latter reason it has not the requisite flexibility or range of speed; that is, it will not run as slow without load, without missing explosions, as a four-cycle will.

It is also assumed by some that the two-cycle is more difficult to keep cool, on account of the frequency of the explosions, but when it is considered that the hot gases of an explosion are in the cylinder of a four-cycle fully one-half of the complete cycle, either as an explosion or as exhaust, and that they are in the two-cycle a little less than one-half of its

cycle, the assumption does not seem to be justified, and considering the great power of the two-cycle, the volume of water that would successfully cool, say, a 10-horsepower two-cycle, would not keep cool, under the same conditions, a 10-horsepower four-cycle—although taking cylinders of the same size the difference might possibly be slightly in favor of the four-cycle.

Some have also contended that because all power ceases the instant that the exhaust port opens, and the power stroke is shortened by the width of the exhaust port, that that much of the power stroke is a dead loss, both in power and in efficiency. It must be remembered, however, that in order to get the greatest power and efficiency of a four-cycle engine, its exhaust valve must begin to open at a point in its power stroke at least as early as the exhaust port of a two-cycle does, or it will not be open wide enough by the time the piston begins its exhaust stroke to allow the exhaust to escape fast enough to prevent perceptible back pressure at high speed. We can therefore settle down to the conviction that all real advancement in two-cycle development will be in improving it along the three lines mentioned.

Admitting the Charge to the Crankcase.

We will commence with the admission of the charge to the crank chamber or the air pump end of the piston. While an automatic poppet or check valve is not so objectionable here as it is in the admission valve to a four-cycle, because having only a few pounds of pressure and no excessive heat to withstand, it can be made of large area and of light construction, yet it will make some noise in closing and unless held to its seat by a stiff spring considerable of the charge will escape before it closes, when running at a high speed. On the contrary, if a stiff spring is used, it will close the valve before the vacuum will be completely filled, so in any event there will be a loss in the pumping capacity of the piston except when running at one particular speed at which the inertia of the valve will overcome the closing action of the spring long enough so that the piston is exactly on its center when the valve seats itself.

The three-port engine is one in which the inlet is a port uncovered by the piston as it approaches its top center—we assume throughout these papers that the engine is vertical, with the cylinder above the crankshaft. This does away with the valve and its noise, but not with the loss in pumping capacity, for no compression can take place in the crank chamber until the piston has again covered this inlet port, and the piston pushes out again so much of the charge as is represented by the area of the piston multiplied by the width of the port. There are other objections to the three-port engine which have been discussed before in these columns.

A Mechanically Operated Valve Suggested.

The true solution of the problem, in the writer's opinion, is a mechanically operated valve of some kind; it is much better to have this in the form of a large port, covered by a flat plate that will open and close the port at proper intervals, the same as the slide valve of a steam engine. This valve may be driven by an eccentric on the crankshaft. If the plate is upon the inside of the crank chamber, the compression will not hold it air-tight against the port seat. As there is not nearly so much heat at any time as there is in a steam engine, a sliding valve of any kind is perfectly practical; probably the simplest and best construction is to have a semicircular port in the side of the crank chamber, having the center of the crank as the center of its radius, a round, flat disk with a hole in its center to loosely fit the crankshaft at a point close to the crank, a keyway in the disk and a spline key in the shaft, all fitted so that the disk will revolve positively with the shaft but so that a light coil spring will slide the disk on the shaft and hold it lightly against the side of the crank chamber on the port seat, and a semicircular port opening in the disk to register with the semicircular port in the wall of the crank chamber when the disk, revolving with the crankshaft, brings the disk port over the crank chamber port. These ports can be made of very large capacity, as no bad results are produced by having them extra large. When they open, practically full atmospheric pressure in the crank chamber is attained at any speed of the engine, if they are extra large. They can be designed so that they will open and close at any point in the cycle, but the best results will be attained usually by having them opened exactly on the lower center, and close slightly after the upper center, the syphoning action of the exhaust and the ramming effect of the inlet (referred to previously in these columns) will have full play with this construction. No vacuum, except sufficient to move the air, will be produced, and the full pumping capacity of the piston will be utilized, and with the proper ports in the cylinder and a

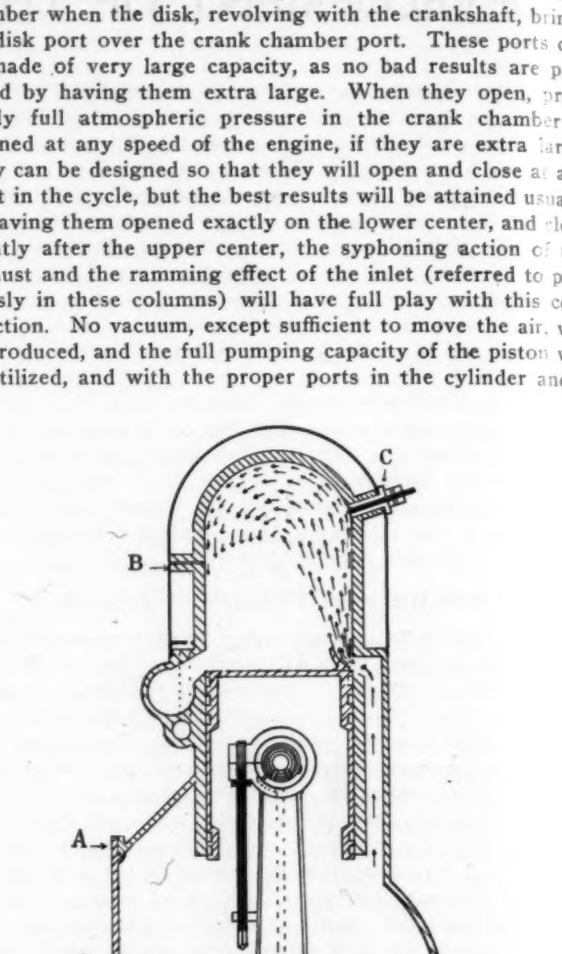


FIG. 1—SECTIONAL VIEW OF TWO-CYCLE MOTOR.

perfect deflector the cylinder will receive and retain as full and complete a charge as in a four-cycle. The pull on the carbureter will be light on the bottom center and gradually increase and then decrease again as it approaches the top center, when it ceases. There will be no back flow whatever from the crank chamber back into the carbureter if the inlet port opens and closes at the proper instant. Any form of carbureter will work as well or better (with this form of admission to the crank chamber) than on a four-cycle, while with a three-port admission there is no carbureter on the market that the writer knows of that will work with even reasonable satisfaction. We find many of the most successful three-port two-cycle engines fitted with mixing valves instead. This brings us to

The Cylinder Ports and the Deflector.

While within the last six or eight years there has been a marked improvement in design and a more intelligent conception of the objects to be attained and how to attain them in laying out the inlet and exhaust ports, there has been but little, if any, improvement in the deflector, one of the most vital points in a perfect two-cycle engine. The ports should

completely encircle the cylinder, except for the bridges across to connect the section above to the section of the cylinder below the ports and to keep the piston rings from springing out into the ports. In a six-inch bore cylinder the bridges separating the exhaust from the inlet port need not exceed one inch across, and there should be two or three very thin bridges across the inlet port. These bridges should not exceed 1-8 inch in thickness at the bore of the cylinder; 1-16 inch is better if you can keep them from crumbling on the edge when boring out the cylinder. The thicker they are the more they obstruct the entering charge and mar the perfect action of the deflector. A 1-32 inch will steady the piston rings across the port as well as 1 inch would, provided the rings do not have more spring in them than is good gas engine practice; if they have, very thin bridges would tend to wear a slight notch in the rings at the point where they pass over the bridges.

Improving the Exhaust Port.

The exhaust port should have one wide bridge across its center, and a hole drilled or cored perpendicularly through its center from the water jacket on top and down to a point below the exhaust chamber. This hole is represented in Fig. 1 by dotted lines from the water jacket down across the exhaust chamber to the water inlet; the water enters the water jacket through this hole and keeps the bridge from becoming hotter than the other parts of the cylinder. In the sectional view of the engine, shown in Fig. 1, the hole through the exhaust port bridge would come on the section in the position shown by the dotted lines. The bridge fills the port at this point, and nearly half of the exhaust chamber, so in order to make the design of the port clear we do not show the bridge at all, only the hole through it.

A little above this hole a rib should be on the cylinder, extending out so as to be in contact with the water jacket shell and horizontally around the cylinder about one-eighth of its circumference each way (one-quarter of the circumference in all); this rib should have holes through it at close intervals and they should be close to the cylinder, and its purpose is to deflect the water from going straight up and to distribute it evenly around the exhaust side of the cylinder.

The exhaust port should be from one-sixth to one-seventh and the inlet from one-tenth to one-twelfth of the length of the stroke in width—the bottom of the ports all on the same horizontal plane—the exhaust port will then open so far in advance of the inlet port that the cylinder will be completely relieved of pressure before the inlet port opens. This may seem almost incredible when the engine is running at, say, 2,000 revolutions per minute, but when you consider the enormous capacity of these ports, and that the opening is entirely free from obstruction, such as open or partly open valves, you will see that it is so. The exhaust expands from a pressure of from 50 to 60 pounds absolute down to atmosphere. As the temperature always keeps exact pace with the pressure, this expansion so reduces the temperature that, although the exhaust was at a bright red heat before the port opened, as soon as it has escaped that which remains in the cylinder is not nearly hot enough to ignite the charge admitted at this instant by the further descent of the piston, uncovering the inlet port and allowing the charge compressed in the crank chamber to escape into the cylinder.

By making the ports nearly a complete circle around the cylinder, we not only get the greatest capacity of the port, with the least loss of stroke possible, but what is of still greater importance, it is necessary in order to completely expel the exhaust by means of the fresh charge.

The significance of this expression will be better understood by mentally comparing the action that will take place with ports of this construction, and the action that obtained in usual practice a few years ago. Then, say in a six-inch bore cylinder, the inlet and the exhaust ports would each be two, or at most two and a half, inches long, measured on the circumference; the deflector threw the charge to the top of the cylinder and over to, and some of it out of, the exhaust port, leaving the masses of the exhaust on each side of the inlet—across to the exhaust port—undisturbed in the cylinder. The exhaust port opened so little in advance of the inlet that firing back into the crankcase was common and was sure to occur if the engine was run up to speed; usually about 300 revolutions per minute for a six or eight-inch stroke was the extreme limit. When this was exceeded, backfiring would slow down or stop the engine. This was the generally accepted design of two-cycle construction at the beginning of the automobile industry, and a four-cycle engine running at 2,000 revolutions per minute would give 1,000 explosive impulses per minute, each of greater power than any of the 300 impulses that the two-cycle of that time could give. A good four-cycle would give about four times the power that a two-cycle of the same size would, each running at its highest efficient speed. With such ports and other parts as we have and will describe, 2,000 revolutions per minute is not the limit of efficient speed of a two-cycle engine of six-inch stroke.

(To be continued.)

COMPENSATED REAR WHEEL BRAKES

IT is known to automobilists who take the trouble to understand their machines that it is imperative that the brakes on the rear wheels should be applied with as nearly the same retarding effect as possible. Otherwise, owing to the intervention of the differential gear, there is a great tendency to slew the car round on the road—a most dangerous proclivity. In order to get over any tendency of this sort the compensating brake mechanism has been devised, says a writer in the Irish *Motor News*.

Generally, it consists of the wire cable, which pulls up the two brakes, passing through the center of the hollow transverse shaft to which the hand lever is attached. Sometimes it consists of a draw-bar, coupled to the hand lever pivotally at its center, and coupled to the brake-rods at its ends—one at each end. Such an arrangement has, of course, a more easy compensating action than the flexible wire, which often has to run round sharp, stiff corners, and thus cannot properly compensate unless the difference in the pressures on the two brakes is great enough to overcome the friction of the cable being pulled through the tube and around the bends of the levers. Now it would appear that neither of the two systems can work properly, unless the condition of the brake drums and shoes in the rear wheels is approximately the same. Thus, if one is oily and greasy and the other dry, it is obvious that the dry brake will give a much greater retarding effect than the oily one with the same pull on its mechanism; and, while our compensating mechanism insures an equal pull, it will be seen that it does not get over the difficulty of brake shoes and drums which are in a different condition to each other. I think, therefore, that it is necessary to point out that motorists should not place too much reliance on the fact that they have compensated brakes. They should insure that each brake is properly adjusted and both free from oil or any other substance such as would cause one to get a better grip than the other with the same pull. In other words, the condition of both brakes should be such that they will act with somewhere near the same retarding effect with a given pull. The use of the compensating device may then be relied upon to perform its proper function; that is, to equalize the pressures, so that one wheel may not tend to accelerate the other through the medium of the differential gear.

TRACY'S PASSING OF WAGNER.

In reply to the statement of G. M. MacWilliam, president of the Darracq Motor Car Company, printed in THE AUTOMOBILE last week, wherein it was claimed that Tracy never passed Wagner at speed in the Vanderbilt Cup race, John A. Kingman, of the Locomobile Company of America, supplies the following letter, written by himself, and a memorandum compiled by A. L. Riker, the designer of the car which Tracy drove:

Mr. Kingman to Mr. MacWilliam.

Bridgeport, Conn., Oct. 18, 1906.

Mr. G. M. MacWilliam, Darracq Motor Car Co., New York, N. Y.

Dear Sir:—Your letter of October 15th, addressed to The Locomobile Company, has been referred to the writer for reply. In regard to the Locomobile advertisement in The Automobile for October 11th, a part of which seems to you to be in error, will say that the statement is really correct, and that Mr. Wagner must be mistaken.

A. L. Riker has been collecting a great deal of information about Tracy's experiences in the race, and I am convinced that after reading a memorandum which he has just sent to me, and which I am enclosing, you will appreciate perfectly that the advertisement is not in error.

The writer desires to make one other matter clear, and that is that he and his associates would under no conditions do or say anything to detract from the victory of the Darracq car or from Wagner's skill.

This letter gives us an opportunity to congratulate you on your victory, and, hoping that next year we may be able to enjoy another good day's sport, such as occurred on October 6th, beg to remain

Yours very truly,
THE LOCOMOBILE CO. OF AMERICA,
J. A. KINGMAN, Advertising Manager.

Mr. Riker's Memorandum.

Mr. J. A. Kingman:—

Regarding Mr. MacWilliam's letter, I will state that from the information which I have been gathering since the Cup Race, it would appear that Tracy passed Wagner about a mile beyond the East Norwich turn, on the tenth lap. I have records from Mineola and East Norwich showing that on his ninth lap Wagner passed Mineola about one minute ahead of Tracy, and the official record on this round shows that Wagner passed the grand stand about one minute and seven seconds ahead of Tracy. Our own records at East Norwich on the tenth round show that there was only a difference of a very few seconds between them at this point. This being the case, Wagner must have been running slowly on account of his tires from the time he left Mineola until the time he arrived at Bull's Head.

In talking over the question with Tracy and his assistant, Al. Poole, as to where they passed Wagner, they both agree that it was about a mile beyond the East Norwich turn on Wagner's tenth lap. From reports of our men at the East Norwich control they state that Wagner passed first with Tracy almost immediately behind him. This agrees exactly with Tracy's and Poole's statements as to when they made the turn at East Norwich they saw the Darracq immediately in front of them.

As Tracy knew the road, having practised over it so often, and knowing that the road was not safe to pass immediately after leaving East Norwich, he did not attempt to do so until he got to a stretch on the North Hempstead turnpike, which he had previously picked out for passing anyone on that stretch. He there opened up his car and went by Wagner. He states that at that time the Darracq was traveling at least eighty miles an hour, and he particularly noticed two things—one was the number on the rear of the machine, and the other the two steel non-skid bands on the two rear tires, which had become brightened. He further states that he does not believe that Wagner could have possibly been making the speed that he was, had he had flat tires.

Our records further indicate that Tracy passed the Hairpin turn four minutes ahead of Wagner, owing to the fact that Wagner stopped from two to three minutes to replace tires.

Our records indicate that, whereas Tracy was one minute behind Wagner at Mineola when Wagner was on his ninth lap, Tracy was over four minutes ahead of Wagner at Mineola when Wagner was finishing his tenth lap. Our records also show that from the Hairpin turn to the grand stand Tracy's time of passing our various controls was approximately four minutes in advance of Wagner, this time never being less than the said four minutes from the Hairpin turn to the finish.

As Tracy's last lap was not a remarkably fast one, over two minutes slower than some other laps he made, and, as it is fair to presume that Wagner, having stopped the time he did and knowing that he was only a short distance ahead of Lancia, was not loafing, it is reasonable to suppose that Tracy passed him while he was at speed, as, after Wagner had changed his tires, he was unable to overcome any of Tracy's lead, and, as I stated above, this lap of Tracy's was not a remarkably fast one.

What has probably confused Mr. MacWilliam is the error made by several of the technical journals in printing the time of Tracy's finishing his eighth lap, which is incorrect, as it is a well-known fact that Tracy finished four minutes in advance of Wagner, and yet the elapsed time given to Tracy for his eight laps is four minutes slower than Wagner's elapsed time for his ten laps.

Would state that from records kept by myself at the timing stand, and as also kept by several press men who are well acquainted with timing, agree that he passed the grand stand approximately four minutes ahead of Wagner.

I have also been informed that Wagner and other foreign drivers do not believe it possible for a car to have made the circuit in 26:20:4-5, which was Tracy's record for the course. It may interest Mr. MacWilliam to know that we have times taken at Jericho of Tracy, after he started away from the tire control in his fourth lap (in which his official time was 31:38) of 25 minutes and 30 seconds from Jericho to Jericho. We have also the time taken nearer East Norwich, where Tracy had gotten to speed on this same lap, of twenty-five minutes flat. While the twenty-five minutes flat may be correct, yet I am absolutely positive that the time of 25:30 from the Jericho tire control to the Jericho tire control IS correct, as this time was caught by a number of gentlemen who are experienced timers.

I think Mr. MacWilliam will be able to see from the above that Tracy DID pass Wagner at speed. A. L. RIKER.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

Dec. 1-8.....—Seventh Annual Automobile Show of the Automobile Club of America, Grand Central Palace, New York City, under the patronage of the American Motor Car Manufacturers' Association.

Jan. 12-19.....—Annual Automobile Show of the Association of Licensed Automobile Manufacturers, Madison Square Garden, New York City.

Feb. 2-9.....—Chicago Automobile Show, Coliseum and First Regiment Armory. S. A. Miles, manager, 7 E. 42d Street, New York City.

Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Association; E. E. McMasters, manager.

Feb. 18-23.....—Fifth Annual Automobile Show, Buffalo, Convention Hall. D. H. Lewis, manager, Teck Building, Buffalo.

March 9-16.....—Boston Automobile Show, Mechanics Hall and Horticultural Hall, Boston Automobile Dealers' Association. Chester I. Campbell, manager, 5 Park Square, Boston.

April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.

Tours.

Nov. 7-10.....—New York, Commercial Vehicle Test, under the auspices of the Automobile Club of America.

Race Meets and Hill Climbs.

Oct. 27.....—New York City, Empire City Track, Automobile Races.

Oct. 27.....—Bethlehem, Pa., Automobile Races, Bethlehem Automobile Association and Pennsylvania State Fair Association.

Nov. 6.....—Newark, N. J., Weequahic Park, Waverley, Election Day Race Meet of the New Jersey Automobile and Motor Club.

Nov. 29.....—Riverside, Cal., Thanksgiving Day Hill Climb, Box Springs Grade Hills.

Jan. 22-26.....—Ormond-Daytona (Florida) International Race Meet, Florida East Coast Automobile Association.

FOREIGN.

Nov. 1.....—New Zealand International Exhibition opens at Christchurch.

Nov. 1-16.....—Berlin (Germany) Automobile Exhibition.

Nov. 15-24.....—London Olympia Motor Show.

Nov. 23-Dec. 1..—London Stanley Show, Agricultural Hall.

Dec. 7-23.....—Paris, Ninth Annual Salon d'Automobiles, Grand Palais.

Dec. 15.....—Calcutta, India, Exhibition of Automobiles, etc., Automobile Association of Bengal.

LETTERS INTERESTING AND INSTRUCTIVE

This Is a Good One.

Editor THE AUTOMOBILE:

[440.]—I have a four-cylinder car of standard make, which has developed a trouble that I believe is unique in the history of the industry. I and a party of friends took the car out for a long ride last Sunday, and, after we had driven rather hard for the most of the day—over a distance of about two hundred miles—the engine began to work poorly, failing to develop its full power. We suspected that some of the gasoline we secured during the day was not of as good a grade as it should have been, but beyond this there was nothing that could conceivably have caused the difficulty. While not experts, all of us are pretty familiar with standard automobile practice, so we sought the source of the trouble in the fullest expectation of finding it quickly. Our hopes have not been realized, and the car at this writing is still inoperative, it having become worse rather than better as a result of our efforts. All of this, we realize, is not greatly out of the ordinary, but here is what impresses us as being the truly amazing feature of the whole affair: In testing the spark plugs, naturally having concluded that something might be wrong with the ignition, we found that with one of the spark plugs taken out and laid on its side on the cylinder, the engine ran as well as it possibly could be expected to run on three cylinders. This led to further experimenting, and each plug was tried in the same manner—the ignition leads not being disconnected—and it was found that the engine would run on any three of the four cylinders, when the spark plug was removed from the fourth one. Nothing seemed to be wrong with the commutator, and there were sparks at all of the plugs—at least, in the open air. The valves are certainly all right, and correctly timed. The thing was tested over and over, and there is no doubt whatever of the absolute correctness of the facts as here given. Upon attempting to start the engine with all four cylinders working, there are several gradually-weakening explosions, and then the engine stops, especially if the clutch is engaged and an attempt is made to drive the car. With the three cylinders only—no matter which three—the engine runs vigorously and, if the clutch is engaged, will pull the car. Trusting that you will call your experts together and give this letter the consideration we think its interest warrants, I am

Buffalo, N. Y. JOSEPH FLETCHER.

The difficulty you have experienced certainly is decidedly out of the ordinary. In fact, we are free to admit that it took much thought by the entire technical staff of THE AUTOMOBILE to come to an agreement on the subject, though now that this agreement has been reached we feel sure that we have arrived at the correct solution, and shall be interested to know how you come out. Also, we shall be pleased to give space to the opinions of other automobile users who, perhaps, may have encountered a similar curiosity in the way of motoring difficulty. The fact that the spark plugs all seemed to be in good order, and that the engine had been giving no previous trouble with ignition, seems to exclude ignition difficulties, if this were not sufficiently excluded by what you say about the engine running on any three cylinders. It is clear that in some manner the provision of an opening into one of the cylinders permits the other three to function, and there is only one way that this could be possible. Undoubtedly the muffler is obstructed—by deposits of soot from the bad gasoline you mentioned, by working with too rich a mixture, or by an excess of lubricating oil—with the result that there is no egress for the exhaust gases. These, therefore, accumulate in the exhaust passages until so great a back pressure is set up that the engine cannot run. Relieving one of the cylinders, however, by the removal of a spark plug, provides a passage for the exhaust from the other cylinders, which, in this case, flows out through the exhaust valves, around by way of the exhaust pipe, and into the relieved cylinder, passing into it through the exhaust valve, which is opened by the rising pressure behind it. This pressure will be in the neighborhood of fifty pounds, which is ample to open an exhaust valve from beneath, against the tension of its spring. Once in the relieved cylinder, the gases can escape through the spark plug opening, which they will do without being noticeable, because of the commotion normally caused by the reciprocation of the piston. Were the car fitted with a muffler "cutout" manipulation of this will quickly locate the trouble.

Anti-freezing Solutions.

Editor THE AUTOMOBILE:

[441.]—Will you please give me the consensus of opinion as to the best anti-freezing mixture to use in automobiles?

Atlanta, Ga. W. H. KISER.

There are several kinds of anti-freezing mixtures regularly on the market, and in general use, and all of them give more or less satisfaction. From the standpoint of its cooling efficiency alone, no anti-freezing solution is as good as water. A solution of calcium chlorid in water, the proportions being governed by the temperature likely to be encountered, is much approved, and does very well with copper tanks and radiators. It has, however, a markedly corrosive effect on galvanized iron tanks, making it unsuitable for use in cooling systems in which this material is employed. To maintain the car in good condition while using this solution, all losses from evaporation should be made up by the addition of pure water, while losses through leakage should be made up by the addition of fresh solution. Glycerin and water, in various proportions—about 25 per cent., usually—is very good, but will not stand as low temperatures as the calcium-chlorid solution, unless the proportion of glycerin is so considerable as to make the mixture too thick to flow freely. Also, the glycerin exercises a destructive action upon rubber connections in the piping. Alcohol and water—from 25 to 50 per cent. alcohol—constitutes one of the best anti-freezing solutions that can be had, and the only thing that has prevented it from coming into more extensive use has been its cost and ignorance of its advantages. It loses rapidly by evaporation, requiring more or less frequent replacement unless the cooling system is almost hermetically sealed. This is a not inconsiderable factor in making for the high cost mentioned, and, moreover, involves rather close watch of the mixture to keep its proportions constant—the alcohol tending to evaporate out of the water. With a very large proportion of alcohol, the solution is inflammable, and care must be taken to avoid fire.

The Causes of Spontaneous Combustion.

Editor THE AUTOMOBILE:

[442.]—Is it possible for rags and waste, soaked in oils and greases, to catch fire spontaneously? G. DELAPLAINE HALL.

Highlands, N. J.

It often has been observed that spontaneous combustion does occur from just the conditions you describe. Waste and rags, particularly cotton rags, if in quantity to form somewhat of a mass, and the whole not absolutely soaked, but simply more or less impregnated with lubricating or other oil, gradually heats up, and, under favorable conditions, may catch fire. The action seems to be due to a sort of decomposition that takes place, this decomposition being accompanied by the evolution of heat, which, rising by successive increments, finally reaches sufficient intensity to ignite the combustible subject of its action. It never has been explained definitely what the exact nature of the chemical action is, but its existence is generally recognized, and is credited with having been the cause of many mysterious fires. Possibly it may be due to acids formed from the oil.

A Question Regarding Flash Boilers.

Editor THE AUTOMOBILE:

[443.]—There was a firm having on exhibition a flash boiler at the automobile show in the Coliseum at Chicago, two or three years ago. It was made out of pipe coils and carried only water enough to be turned into steam at once. It was a vertical boiler and had two gauges on it. Can you give the writer any information concerning the outfit? W. W. HARKNESS.

Amsterdam, N. Y.

Without a more detailed description, it is impossible to say with certainty just what the boiler was that you saw, but your statements seem to make it obvious that it could not be materially

different from the types of flash boilers commonly used in steam-automobile practice. The White cars utilize a boiler that answers in a general way to your specifications, since it is composed of series of coiled piping, into which the water is injected by a pump and immediately thereupon "flashed" into steam, the rate of pumping being determined by the amount of steam that is required. The Salamandrine boiler, which was made by a New Jersey concern, may have been the one you saw, since it also answers to the same general description. Upon application directly to the White people, or to any other of the prominent makers of steam cars and accessories, most of whom advertise in THE AUTOMOBILE, you should have no difficulty in securing catalogues and any other information you may require. With one or two minor exceptions all modern steam automobiles are equipped with boilers of the flash type, made of tubing variously coiled and assembled into forms similar to that you describe.

The Maker of the American Roadster.

Editor THE AUTOMOBILE:

[444.]—Can you give me through your columns the address of the firm making the American Roadster? The car I refer to was seen at the Vanderbilt Cup Race and has an entirely underhung frame.

Philadelphia, Pa. O. D.

The American Motor Car Company, Indianapolis, Ind., manufactures the American Roadster. Covell & Crosby, Broadway and Fifty-seventh street, New York City, are the metropolitan agents.

TRANSPORTATION PROBLEM OF THE TROPICS.

Editor THE AUTOMOBILE:

[445.]—I am desirous of obtaining some general information and general views from men well advised in regard to vehicles of the automobile type as to their present and prospective use in the Tropics. Man's greatest obstacle in the development of the Tropics has been the difficulty of transportation in the interior. He could send his products by steam vessels to the coasts of the tropical countries, but he could only distribute them to the interior by the physical power of man or beast, and this was difficult to apply successfully in that climate.

In the temperate zones the horse has proved the chief transporter from the river or railway to the consumer, or from the producer to the river or railroad, but in the Tropics the horse can accomplish comparatively little because of climatic conditions, and this is true also of man. In practically all of the tropical countries the number of draft animals, especially horses, is small, and their quality far below those in the temperate zone, and in transportation, agriculture, mining, and in fact all the industries, man has been greatly handicapped by the difficulties of transportation from the place of production to the river or railway.

With the discovery that the power of the waterfall can be turned into electricity and carried on a wire to the place where power is required, the possibilities of agriculture, mining, and even manufacture in the Tropics are greatly increased, and this is true also of transportation upon rails. But it is not, of course, and never will be practicable to lay rails to every man's door or plantation or mine. The lack of this connecting link between the producer and the great transportation line (by river or rail or ocean) cannot be successfully supplied by animal power for the reasons which I have above suggested.

It seems to me, however, that the discovery that self-propelled vehicles can be operated over dirt roads and merchandise transported from the producer to the railway or river opens great possibilities to the future development of the Tropics. I have heard of some instances in which freight-carrying automobiles, or machines built to haul trains of wagons, have been very successfully operated in tropical countries where horses could not be successfully used, and this, it seems to me, may be the beginning of new and important developments of commerce in those parts of the world.

I should be glad if I might have the benefit of your views upon the subject, and also the addresses of such people as you might have in mind who would be able to discuss the matter intelligently from their personal experience in constructing vehicles of the automobile type for use in the Tropics or from their actual exports of such vehicles to those parts of the world.

I may be overestimating the importance of this subject in its relation to the future development of those sections of the world in which I think the next great development must come—the Tropics—but I feel that it is from those who are studying this subject in the manner in which you are and from others whom you may be able to suggest to me that the best information can be had, aside from the mere figures of actual exportation, which are, of course, available to me, but which are not so classified at present as to enable me to fully determine the relation of the freight transportation idea to the actual exports of machines, which are reported under the title of "automobiles" and not classified as to their prospective use as transporters of merchandise or men.

O. P. AUSTIN,
Washington, D. C. Chief of Bureau of Statistics
Department of Commerce and Labor.

GRAPHITE AS A LUBRICANT FOR BALL BEARINGS.

Editor THE AUTOMOBILE:

[446.]—Referring to the communication of the Hess-Bright Manufacturing Company in The Automobile of October 11, we have this to say: Graphite for ball bearings may be useful, or it may not be—it is just in accordance with how it is used, and what kind is used.

All authorities on lubricants state that graphite is a lubricant, and the best solid lubricant known. It is presumed that these authorities have in mind the crystalline or flake graphite, as the amorphous graphite carries a comparatively large percentage of clay, which is apt to bind the graphite and form masses which frequently give trouble, especially in steam or gas cylinders.

There is, however, another function of graphite which many do not realize and which the Dixon company has been endeavoring to impress upon the minds of engineers and others for these many years. We refer to the use of graphite as a surfacer—something to even up surfaces and make them smooth and true.

The Hess-Bright company in manufacturing ball bearings without doubt aim to get the most perfect spheres possible. That they succeed admirably, we have no doubt, from all that we learn concerning their product, but if one were to examine these marvelously perfect spheres one would find minute inequalities, especially when viewed under the microscope. This we know is true of engine cylinders and fine bearings, and we take it for granted that it is equally true of the best balls made for ball bearings.

A tough, thin flake graphite will build up all of these microscopic irregularities and make a surface that it is not possible to obtain, no matter how perfect the workmanship. In this, we believe, lies the chief function of graphite as a lubricant. It is only tough flake graphite that will do this to perfection. Therefore only enough graphite should be used to perform this function and to keep the wearing parts built up as fast as destroyed.

There is possibly more or less sliding motion even in ball bearings, and it may be because of this sliding motion that we hear so frequently of the usefulness of graphite in ball bearings. It may be, and probably is, true that the graphite builds up the minute inequalities of the channels in which the balls travel, forming not only a smoother finish to the surfaces, but also one that is perfectly lubricated by the marvelously smooth flakes of graphite, which are pinned to all of the microscopic irregularities, forming a veneer-like surface.

JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J. GEORGE E. LONG, Secretary.

WHO WOULD HAVE THOUGHT THIS OF PHILA?

Editor THE AUTOMOBILE:

[447.]—I see by The Automobile that the city of Tacoma has a new ordinance making it possible for the courts to impose a fine as high as $100 for violating the common law of the road, viz., meeting on the right and passing on the left. The city has done a good thing; it should spread to other cities, Philadelphia at least, for of all the cities I have passed through, so far, it takes the string for "Ninevites," direct lineal descendants of that people to whom Jonah was sent to preach, the larger part of whom could not discern between their right hand and their left. In an ordinary street, when it happens to be blocked up on the right side, they take the right of the remaining space and compel you, if they can, to take the extreme left, and if you object they will abuse you as you pass, with indecent language. If they were fined a few times you might "find" them in their place.

A driver of any vehicle on a public street, whether automobile or other conveyance, should be compelled to keep his place and be civil, and it should not require more than three witnesses to secure a prompt conviction and fine of not less than $10 for the first offense. In case of profanity it should be $25 at least, for the first offense, and the second offense should rule such carrion off the street.

I drove horses long before automobiles were thought of, and so am not talking about an unknown quantity; I have been there in both cases and have some of my hair left. There are times when it takes about all the patience you can call up and keep civil, I know, but that is a part of your business, and quite an important part, too, and the closer you stick to it, the easier it will be for you.

Westover, Pa. F. BROWN.

AN ENGLISH CAR AND ITS SKILLFUL SPONSOR

PROMINENT as a manufacturer of automobiles, as a daring and skillful driver of high-powered racing cars, an authority on all subjects relating to automobiles and an ardent devotee of the sport of ballooning, the Hon. Charles Stuart Rolls is a prominent figure just now in the world of sport, and especially those branches which include automobiling and aeronautics. His arrival from England has, therefore, created much interest. Mr. Rolls' object in coming to New York is to introduce and establish an agency for the Rolls-Royce cars, and he has brought two machines with him to be used as demonstrating cars. That this is a most opportune time for such a move is obvious owing to the fact that the recent Tourist Trophy race on the Isle of Man was won by a 20-horsepower Rolls-Royce car, driven by Mr. Rolls, the car covering the 162 miles of the difficult course in 4 hours 6 minutes, making an average sped of nearly forty miles an hour notwithstanding the rule which made it necessary to consume not more than a gallon of gasoline for each 25 miles covered. Mr. Rolls win was most popular in England.

HON. C. S. ROLLS AT THE WHEEL.

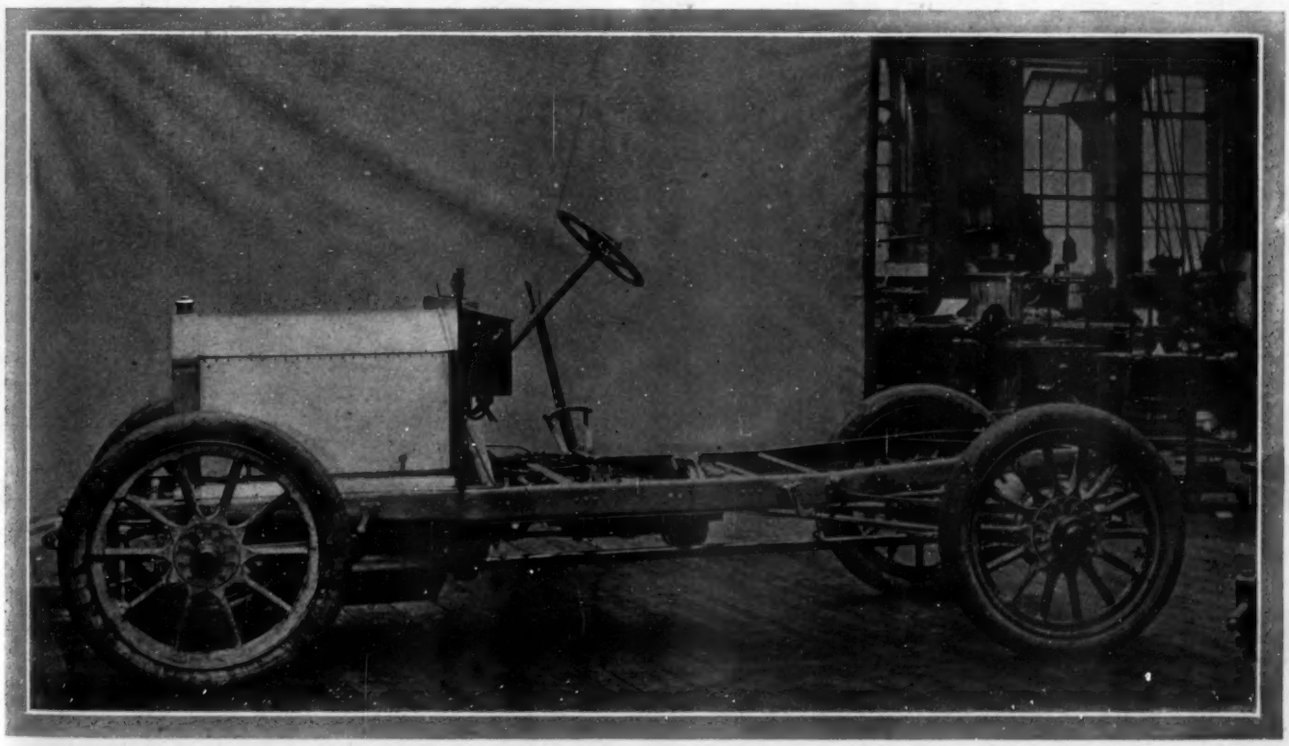
Mr. Rolls' sportsmanship is unaffected by his commercial interests, as he proved conclusively by driving a Wolseley racing car in the 1905 Gordon Bennett race. There are not many manufacturers of automobiles who would be willing to take the many chances incident to driving in such a contest for the sake of bringing a rival manufacturer's car as near to first place as his skill would permit.

A competitor in the Coupe Internationale des Aeronautes, the balloon race recently held in France and won by an American, Lieutenant Lahm, Mr. Rolls is intensely interested in the problem of aerial navigation; in fact, he founded the Aero Club of Great Britain and is one of its enthusiastic members.

"While these balloon races and ascensions may not, perhaps, directly contribute to the solution of the problem of navigating the aerial oceans," said Mr. Rolls, "there is no doubt that if interest is kept alive and constantly stimulated, invention and experimenting will be encouraged, and sooner or later someone will get on the right track. On the other hand, if general interest in the only branches of aeronautics we can practice is allowed to wane, the stimulus will be wanting and probably more time will be required to bring about the same results. Looking at the matter from this point of view, ballooning may be said to be of real practical use. Personally, I believe that the practical flying machine, when it arrives, will be a form of aeroplane. The difficulties attendant upon the propulsion of a huge gas-bag against any considerable air current are well known, and the size of a balloon of any considerable lifting power is so great that a very powerful motor is necessary to drive it, and the problems increase rapidly with size. I hope to participate in the international balloon race to be held in this country, and will do so if I am given a place on the British team.

"I believe that automobile races in which the sole object is enormous speed will eventually be superseded by more practically useful, if less brilliantly spectacular, touring contests in which the qualities required in the ordinary touring car are brought prominently to the fore."

Mr. Rolls is accompanied by Captain C. E. Hutton and Miss Hutton on his American trip.



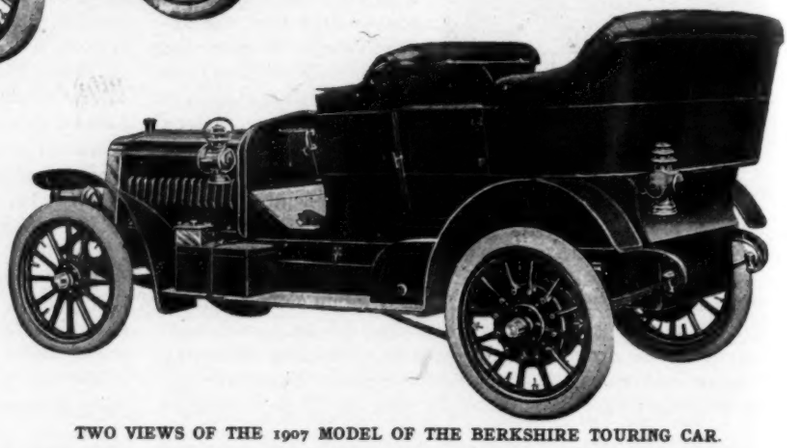
CHASSIS OF THE ROLLS-ROYCE WHICH WON THE TOURIST TROPHY RACE ON THE ISLE OF MAN.

THE BERKSHIRE PRESENTS ITS 1907 MODEL

ONE model only will be manufactured by the Berkshire Automobile Company, of Pittsfield, Mass., for the season of 1907, and the concentrated energies of the factory will be directed to the perfection of the same. This is the announcement made on the advance sheet just issued by the company, which illustrates and describes next year's product and which illustrations are reproduced on this page.

The Berkshire for 1907 is a strictly high-grade touring car, fully equipped and guaranteed by the makers, and sold for $3,500. The wheelbase is 118 inches, axles nickel steel, I beam; transmission, the company's own special selective type, with sliding shaft; double chain drive. The motor is four-cylinder 35 horsepower, and is the same in every essential detail as the motor used during the past two seasons in the Berkshire and which has given such satisfactory results. Such minor changes as have been made are in the direction of quiet running, so that to-day its makers announce a practically noiseless machine. The particular specialty of the Berkshire motor, as set forth by its makers, is its ability at hill climbing. Every machine is tested on the Berkshire hills—in fact it is almost impossible to test a machine out at Pittsfield unless it is done on a hill, and this feature is strongly brought to the attention of the prospective purchaser.

The only changes in the car from last year's model are a trifling increase in the weight and the adoption of ball bearings throughout. The body is of wood, large and roomy throughout, with a capacity of five to seven people. The regular finish is Brewster green for the body with maroon running gear.

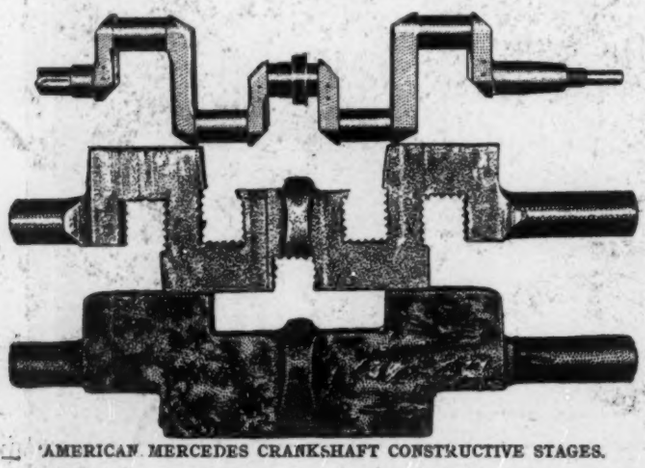


TWO VIEWS OF THE 1907 MODEL OF THE BERKSHIRE TOURING CAR.

CONSTRUCTING AN AMERICAN MERCEDES CRANKSHAFT

From THE AUTO-CRAT.

MUCH depends on the crankshaft of an automobile. From and through it must pass the power of the engine to the wheels. When the car is lifted up a steep hill or is carried along at lightning speed, the crankshaft is reaching backward and forward like a powerful arm, as indeed it is. Probably no other one part of the mechanism of the American Mercedes is more typical of the methods employed in the making of this car than the crankshaft. When it first crosses the Atlantic and arrives at the American Company's works, it is a great steel forging weighing 200 pounds. When it goes into the motor it is a perfected piece of mechanism weighing 50 pounds—the difference is 150 pounds of metallic dust and three weeks' labor. In other words, this solid mass of steel is patiently ground into its perfect form, so that the original steel structure, as it comes from the forge, remains unimpaired, with the result that it is one of the strongest, and at the same time one of the lightest crankshafts in the world for the power developed. It takes one man just three weeks to grind and perfect one of these crankshafts. This is partly due to the care taken, and partly to the extreme toughness of the steel, which is made by a secret process. Its elastic limit is 225,000 pounds to the square inch, and its tensile strength 275,000 pounds.



AMERICAN MERCEDES CRANKSHAFT CONSTRUCTIVE STAGES.

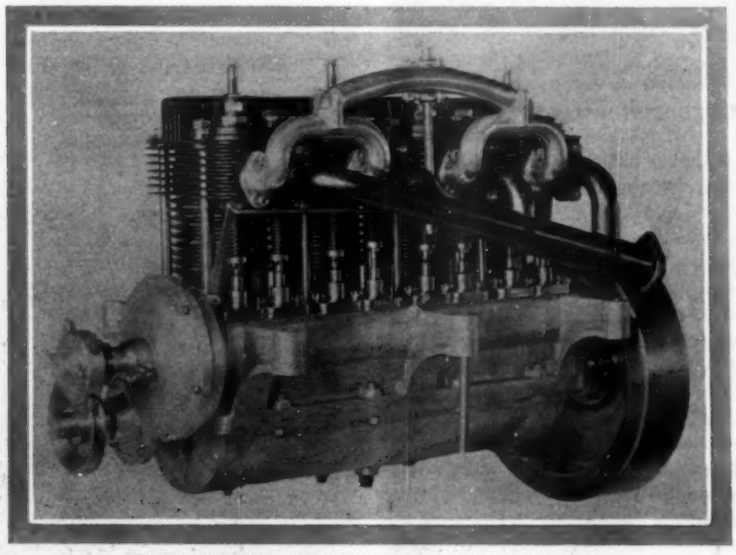
And what is true of the crankshaft, and of the remarkable nature of the material and the great care in its making, is also true of every other part of the American Mercedes car. There is absolutely nothing of thought or work spared in its production. From the smallest to the greatest part of its mechanism, the one guiding thought is perfection. So that you can easily see what it costs to produce a car of this kind, and after you have driven one you will appreciate fully its merits.

THE WALTHAM-ORIENT LINE FOR 1907

VARIETY in an unusual degree characterizes the 1907 line of cars manufactured by the Waltham Manufacturing Company, of Waltham, Mass., whose Orient buckboards and touring cars have become well and widely known. The line ranges from the now famous little buckboard, with 4-horsepower, air-cooled, single-cylinder motor mounted in the rear and geared direct to the rear axle through friction transmission mechanism, to a full-sized touring car of the regular type, with four-cylinder, air-cooled motor of 20-horsepower mounted in front, and driving through a sliding gear transmission.

STEERING WHEEL.

The touring car is made in two models, which differ only in the style of body, the chassis being exactly the same in both cases. Model DL, which costs $2,000, has a body of the finest construction, and is expensively finished; while Model TT, the price of which is $1,750, has a less expensive body, though equally serviceable. Barring the body, there is no difference between the two cars.

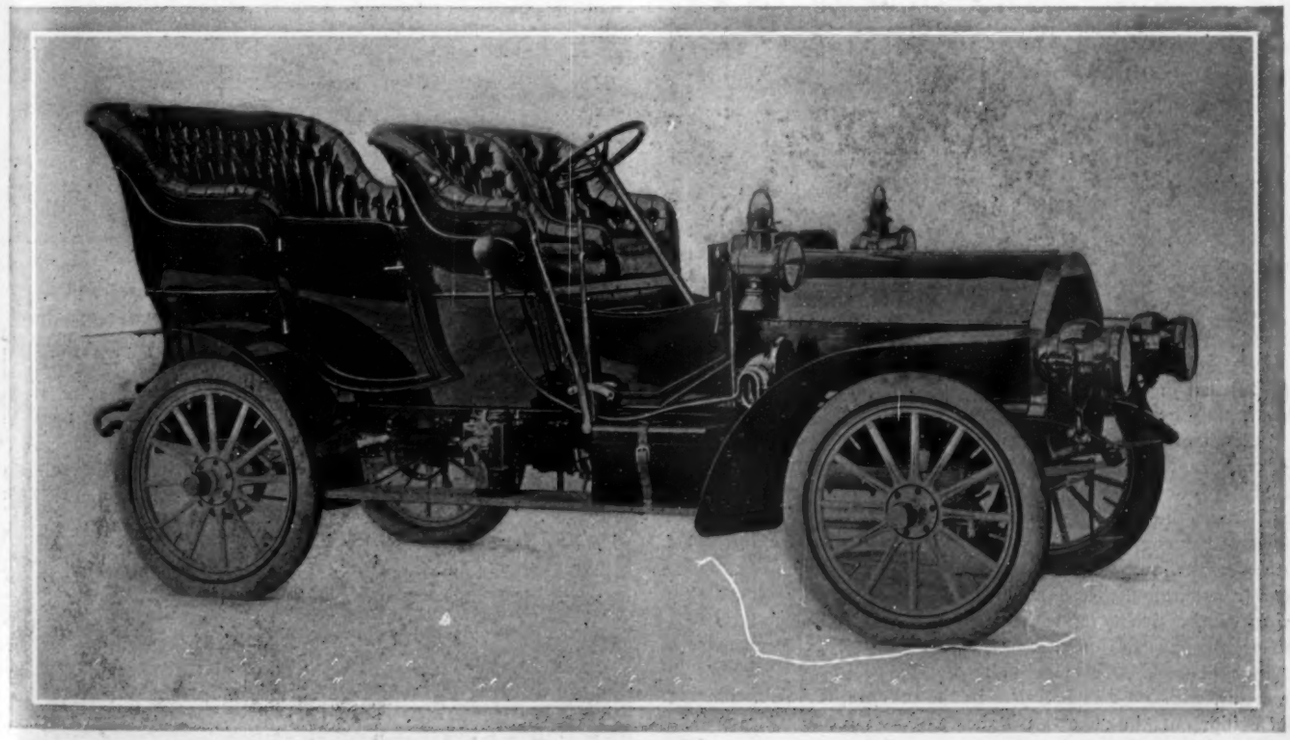


FOUR-CYLINDER AIR-COOLED TOURING CAR MOTOR.

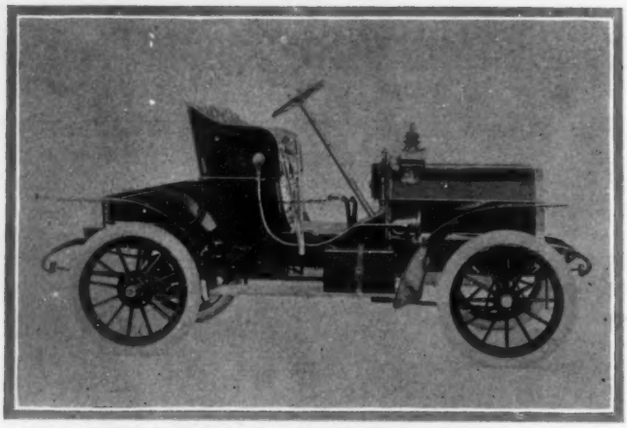
Pressed steel of the usual channel section is employed for the framing, the side frames being tapered. The maximum depth of the frames is 4 inches. A sub-frame carries the engine and the change-speed gearcase. Springs are long—45 inches rear and 40 inches front—and are semi-elliptical all around. The front axle is of heavy steel tubing, 2 inches outside diameter, and the steering knuckles are 1 1-4 inches in diameter; the rear axle is of the live type, with bevel-gear drive. The live shafts are 1 1-4 inches shafts are 1 1-4 inches in diameter, and are carried at their inner ends on ball bearings, and at their outer ends on rollers. Wheels are of wood, 32 inches in diameter, with 3 1-2-inch tires; the wheelbase is 96 inches and the tread the usual standard measurement, 56 inches.

The four vertical cylinders of the motor have a bore of 4 inches and a stroke of 4 1-4 inches, and integral with the cylinders are cast the cooling flanges. Five bearings serve to rigidly support the crankshaft, which is 1 1-4 inches in diameter. The bearings

Automatic in its functions, the Orient carbureter is said by the manufacturers to give a proper mixture at all speeds, and to be sufficiently economical to drive the car fifteen miles on a gallon



WALTHAM-ORIENT MODEL DL 20-HORSEPOWER TOURING CAR WITH FOUR-CYLINDER VERTICAL MOTOR.

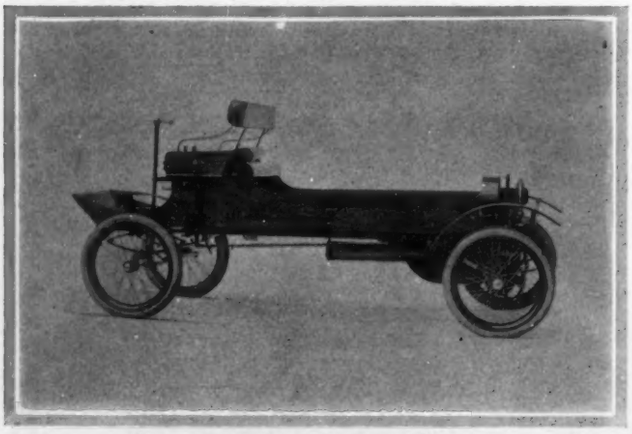


THE FAMILIAR LITTLE ORIENT RUNABOUT.

of gasoline. The gasoline tank holds ten gallons. Priming the carbureter is effected by a primer at the front of the car, outside of the hood. Ignition is by jump spark, with quad coil, of the vibrator type, mounted on the dash.

Transmission of power from the engine rearward is through a leather-faced cone clutch, three-speed sliding gear transmission propeller shaft and bevel gears to the live rear axle.

Brakes are applied in the usual manner. A hand lever at the side operates the emergency brake, consisting of contracting bands on drums on the rear hubs, and a pedal operates the regular running brake, which is a band on a drum mounted on the transmission shaft at the rear of the gearcase. When the emergency brake is applied the clutch is automatically withdrawn. The usual clutch pedal is also fitted, of course. The equipment of the car consists of two 8-inch gas headlights and generator, two side lamps, tail lamp, a French horn, complete outfit of tools, duplex air pump and tire tools. The body and hood of the car



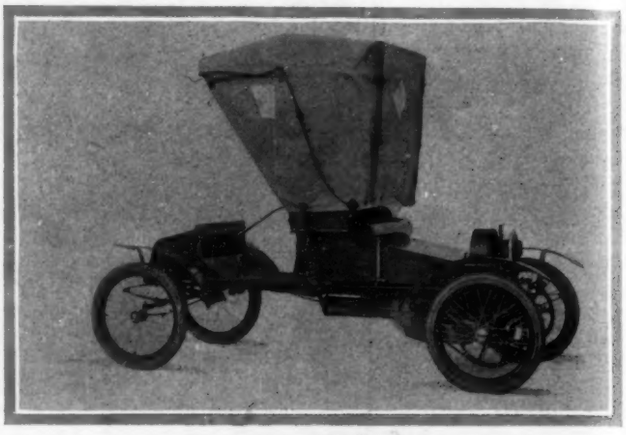
SINGLE-CYLINDER LIGHT DELIVERY WAGON.

are finished in dark Brewster green, with carmine striping, and the running gear is in cream color.

Exceedingly attractive for two-passenger service is the 16-horsepower Model TR. Apart from the body, which is of a jaunty cross-country style, the car is very similar to the touring car, though the dimensions are reduced throughout. The vertical air-cooled motor has four cylinders of 3 1-4-inch bore and 4 1-4 inches stroke, and drives through cone clutch, three-speed sliding gear transmission, propeller shaft and bevel gears, the rear axle being of the live type, with 1 1-8-inch shafts. Springs are 34 inches and 42 inches long, front and rear, respectively; wheelbase, 82 inches; tread, 56 inches. The wood wheels are 30 inches in diameter, with 3 1-2-inch tires. In the matters of finish, coloring and equipment, the runabout is the same as the touring car. The little machine is fast, being rated at 40 miles an hour, its weight being but 1,300 pounds. The price is $1,250.

Next in line are the buckboards and their developments—an interesting group. All are equipped with the same power plant. A single-cylinder, air-cooled motor, of the simplest type, is 3 1-4-inch bore and 4 1-4-inch stroke, and rated at 4 horsepower, and is mounted, with all its accessories, close to the rear axle, which it drives through a friction gearing that has proved very satisfactory in all kinds of service. A fan just in front of the motor throws a flood of cold air on the cylinder.

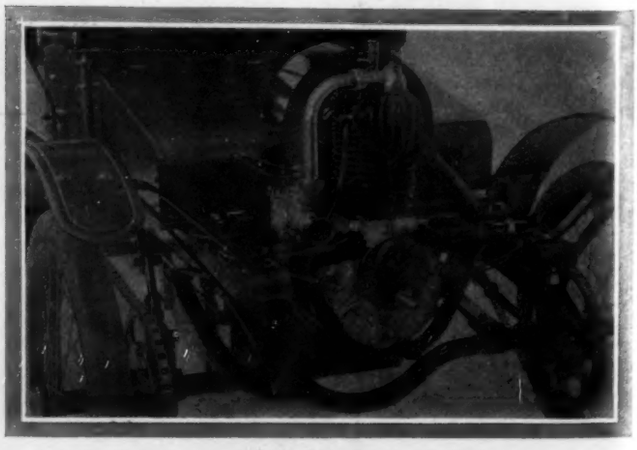
The simplest and perhaps the best known of the buckboards is the little two-passenger machine which is a development of the original Orient buckboard. The addition of a set of springs, a little box forming a dash in front, the cooling fan and the friction drive have, however, made the machine vastly more efficient and comfortable than its prototype. This machine a success, it was a natural step to place an auxiliary seat in front of the main seat, transforming the simple Model BR into a three-passenger car—the front seat being designed to carry one adult or two children. With the addition of a folding top Model BR, without the front seat, becames a doctor's car.



DOCTOR'S BUCKBOARD WITH FOLDING TOP.

In Model DC the same power plant in the same location is fitted to a box-body, open-delivery wagon. Geared down to suit the conditions, the car will carry a total load, including passengers, of 600 pounds.

Models ER and ET have bodies of the regular type, the former being a two-passenger runabout, and the latter a four-passenger tonneau. In both cases the motor and power plant, of the buckboard type and capacity, is in the rear. The runabout is intended for all-around use, and is a good hill-climber, but the four-passenger car taxes the little engine to the same limit, and is intended only for use on smooth and comparatively level roads. Model ER costs $475, and Model ET $525.



LOCATION OF MOTOR IN SINGLE-CYLINDER CARS.

SMART FASHIONS IN AUTO APPAREL

By LAURA R. SEIPLE.

NOW that nearly all the world rides in an automobile, the importance of correct apparel for the pastime has reached a state of no less concern than that which occupies the ordering of proper clothes for ceremonious occasions. To be fashionably as well as comfortably clad for a spin in the auto requires as much consideration on the part of the individual as does the choosing of an evening gown. There are styles in a plenty from which to make selection, it is true, but the all-important feature is to get the style best suited to the individual. To certain types certain colors and

Courtesy of Scandinavian Fur & Leather Co.

THREE-QUARTER COAT OF CIVET CAT.

shapes are most becoming, and there is no reason why one should not take as much pride in her appearance in the motor car as she does on a fashionable promenade.

Too many women make the sad mistake of madly rushing in and ordering this or that hat or coat, a duplicate of which she has seen on some distinguished personage. Whether or not it is the style suited to her face or form, she must have it, and nothing can change her mind. Then again, there are women who fancy they must look a fright in automobile clothes, no matter what they put on, and with the idea that all motor togs make one look spectacular, they accept the first thing shown them. This is the height of folly, since American makers of fine automobile wear have reached a degree of perfection that rivals even French products, where most things fashionable originate. There are dresses, coats and hats for motoring that are just as smart as dresses, coats and hats designed for traveling in the finest drawing-room car. Garments of all kinds take on perfect lines and are finished with a certain cachet that is the "making" of the tout ensemble of other clothes. Hats assume less hideous shapes and hoods are made with an idea of cunning becomingness rather than grotesqueness. The automobile veil in its variety of styles is a boon to femininity. The "made" veil has many modifications which are in a sense practical, but the five-yard-long chiffon veil is far more practical, since it lends itself to all sorts of manipulations and is usually becoming when cleverly adjusted over the hat or cap.

Every day one sees something new in the way of a head covering for motoring. One of the most sensible as well as unique arrangements that has recently appeared is the pongee helmet with mica window. Like many of the combination veils, the helmet gathers onto a ring. The mica window is inserted in the fullness that covers the face and gathers into an elastic band that closes at the back of the neck. The long ends falling over the back of the head may be tied in almost any desired fashion. When properly arranged this helmet is proof against dust and wind, and not only is it recommended for automobiling, but for driving also. So voluminous are its proportions that it will fit any style hat with comfort. Pongee, silk and silk rubber are the materials found in the new motor helmet.

Some of the hats brought out this season are remarkable for their chic. Noticeable among the unusual styles is a trig little shape having a leather Tam o'Shanter crown and fur brim that turns up at the sides and back and forms a decided peak in front. Another smart hat that motoring society has

LONG COAT OF GRAY AUSTRALIAN OPOSSUM.

RUSSIAN PONY COAT—BEAVER COLLAR. SILK RUBBER RAIN COAT AND HOOD. LEATHER-TRIMMED SCOTCH TWEED.

adopted with enthusiasm is of smoke gray leather, piped with suéde. The small crown may be dented according to individual taste, while the narrow rolling brim with endless rows of stitching may be turned to almost any desired angle. Hoods are of no less importance than they were several seasons ago, when they were first introduced for motoring. A stunning affair made of snuff-colored suéde and lined with cream satin is fashioned after the style that Little Red Ridinghood wore on that famous visit to her grandma's. The same little frill on the edge is plaited on, and the curtain at the back faithfully carries out the details of the hood in the nursery storybook.

Many sumptuous fur garments are in use for automobile wear. Every year shows a greater tendency toward elaborate togs. Many persons think nothing of expending several hundred dollars for a motor garment, whereas there was a time not so very long ago when one hundred was thought an extravagant sum for a coat. Some of the new models are handsome enough for the opera, and no doubt many persons will make their expensive fur coats do double service. A fur coat elegant enough for the most fastidious woman is of Russian squirrel. Only the backs of the little animals are used, and they are joined in such a way that the dark blendings unite diagonally and form a stripe. The neck is finished with a high shawl collar, and the long sleeves have deep turnback cuffs.

Another striking fur coat is made of civet cat—that soft, dark brown fur with deep cream colored markings. A handsome lynx collar with cuffs to match completes one of the smartest fur coats exhibited. A huge (huge because it is a huge garment made of huge fur) coat meant for bitterly cold weather is of Australian opossum in its natural color. While this coat may be proof against Arctic winds, it cannot be classed among the ultra-fashionable cuts, since the clumsiness of the pelts does not permit of much elaboration in style. However, this is the coat for long runs and solid comfort, and best of all, its price is not prohibitive—the garment can be owned for less than fifty dollars.

Another practical fur coat is of Russian pony, semi-fitted and three-quarter length, with beaver collar and closed with

GOLDEN BROWN SCANDINAVIAN LEATHER.

ALL READY FOR A SPIN.

COAT OF NATURAL SQUIRREL.

big bone buttons. The richest color is seal brown, although many prefer Russian pony in its natural yellowish-brown tones. A full brown satin lining finishes this garment as handsomely as a more expensive fur coat.

A good many attractive coats of tweed, homespun, and similar materials have been evolved by the best designers of automobile apparel, and are as useful for driving or traveling as for their original purpose. The smartest of the models are in broken plaids or small checks, with gray the predominating color. One of the most effective coats of this character is a mixed gray Scotch tweed; full length, Norfolk effect, with leather trimmings and smoked pearl buttons.

Some of the elaborate automobile coats are made of leather which has been chemically rendered waterproof and which is so soft and pliable that it may be wrought into the most intricate styles. A stunning coat made of golden brown Scandinavian leather is double-breasted, with wide revers extending to the tops of the sleeves and a high military collar that closes snugly about the throat. A simulated belt indicates the waistline, and the skirt falls in graceful folds to a distance of a few inches above the floor. Seams are piped with navy blue leather and the lapels, collar and cuffs are embellished with insets of the same leather. Manipulations of fine soutache braid trim the revers where they join the garment, and handsome metal buttons decorate the front panel. The hood accompanying this coat has already been described.

A swagger raincoat is made of silk rubber shepherd's plaid, piped with white leather and lined with oyster gray satin. A picturesque hood with peaked top and curved edge closes under the chin with two big buttons. The turnover collar is inlaid with fancy scrolls of white leather, as is also the little yoke under it. Besides black and white plaids, all the gay new mixtures are being pressed into service for wind and raincoats. Some of the handsome ones fairly scream, and it is these that society is taking very kindly to.

Of goggles there are many and varied styles and combinations. Perhaps the most practical is the two-piece goggle with detachable glasses. By pressing a small spring the windows are released and colored ones may be substituted. An extra piece of leather lined with white coney can be attached to further protect the face.

Gloves in Scandinavian nappa leather come lined with kangaroo fur or with kid. For severe weather the former lining is recommended. The woman who studies the small details of her automobile apparel chooses such accessories as gloves, boots, bags, veils, and the like, with regard to harmony, but when she elects to venture a trifle further she disregards harmony altogether and comes out in a pair of white or lemon-colored gauntlets. There is nothing that adds or detracts so much from the general appearance as gloves—smart ones add the necessary finishing touch to the costume, and faulty ones detract from even the costliest garb. White gauntlets give the desired chic to almost any style costume, and after all is said and done, is it not that certain dash and style that the average woman seeks?

MAIL CARRIERS AS HIGHWAY ADVOCATES.

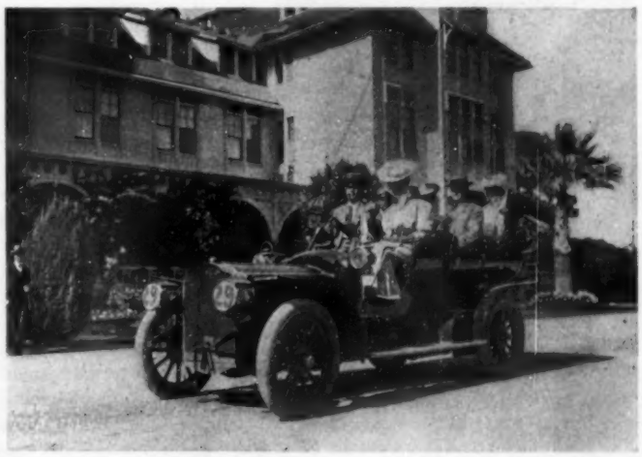
EATON RAPIDS, MICH., Oct. 22.—That the rural mail carriers of Michigan have been one of the greatest factors in the improvement of the state's highways is admitted. The carriers have always been ready to co-operate with the automobile owners in bettering road conditions throughout the state, and have even worked faithfully without the aid of automobilists. At the annual meeting of the Eaton County Rural Letter Carriers' Association the sentiment was that not one-half the assessed labor on highways is actually performed. The belief seemed to be that if one-half the present rate was assessed, paid in money and judiciously expended, the state would have far better roads than under the present system.

BOOKS ON AUTOMOBILING.

An Encyclopedia of Motoring from the Emerald Isle.

A book of unusual value as a reference work for automobilists and persons engaged in the production and sale of automobiles is *The Encyclopædia of Motoring*, edited by R. J. Mecredy and published by Mecredy, Percy & Co., Ltd., of Dublin, Ireland. Embracing 570 pages of text between its board covers, it contains a vast fund of useful information in condensed form, with subjects arranged alphabetically so that any one can be turned to without loss of time. It includes definitions and explanations of all the terms commonly used in connection with automobiles (together with their French synonyms), and thus fills a vacancy that has long existed in the automobile field.

Eighteen pages are devoted to illustrations and brief descriptions of the chief features of gasoline, steam and electric cars. There are assembled plan drawings and side elevations of the modern chassis, with reference letters and accompanying designations of all the parts. Eleven pages are devoted to carbureters, and change-speed gears are treated in twenty-two pages, in which the different types in use are illustrated and described in detail. The same liberal treatment is accorded to the subjects, "Clutch,"



THOMAS FLYER WHICH FINISHED WITH A PERFECT SCORE.

In the recent endurance run of the Automobile Club of California from San Francisco to Del Monte, the car, which was driven by its owner, J. H Baxter had a perfect record. The photo was taken after the run.

"Ignition," "Internal Combustion Engine," "Steering Gear," and "Valves." Supplementing these there is a useful section of 120 pages devoted to "Repairs and Adjustments," which is conveniently subdivided into subjects and illustrated. Twenty-eight pages are given up to the subject of "Timing."

THE HUMOR OF AUTOMOBILING.

WATERTOWN, Oct. 17.—In dodging a street car in Public Square last night, a young son of Joseph Boudia, of 1 Academy street, was struck by an automobile belonging to Milo Cleveland. The bumps on his head were rubbed at Sheldon's pharmacy.

Syracuse *Post-Standard:* An automobile containing a man and woman, stopped short on the Rapid Transit Railway tracks just as it was crossing South Salina into East Water street at 11 o'clock last night. The man alighted and began pushing the machine. The machine suddenly started, and, the woman being unable to steer it, the automobile ran into a lunch wagon, jarring some of the dishes off onto the floor. The proprietor of the lunch wagon hurried out to see what was the trouble. The man was just getting into the automobile. The lunch wagon man tried to see the number of the automobile, but it was covered with mud, and he could not make it out. The automobile started up just then. The lunch wagon man yelled out: "What's your number?" Getting no response, he yelled again. The woman in the automobile turned around and called back, "23."

CLUBS BUSY THOUGH THE SEASON WANES

Worcester Club's Latch String is Always Open.

WORCESTER, MASS., Oct. 22.—The clubrooms of the Worcester Automobile Club are a great gathering place for members of the A. A. A. and its affiliated clubs. The Worcester organization greets all A. A. A. members in such manner that there can be no question regarding their welcome. The sign on the door tells its own story, and the conveniences of the enterprising club have been generously appreciated by a heavy patronage of the club restaurant, which is conducted in first-class style. The club is now one of the largest in the A. A. A., and President J. T. Coghlin predicts that a most substantial increase will take place before the beginning of another year.

WORCESTER'S WELCOME TO A. A. A. MEMBERS.

The spirit of fraternity which the Worcester Automobile Club has been so instrumental in developing was amply evidenced at the recent gymkhana games of the club at Worcester Oval. Invitations were sent to all A. A. A. clubs, and, although the event had to be postponed from September 22 to September 29 on account of inclement weather, representatives were present from almost every New England club, and several from New York City and vicinity.

A. C. of Buffalo to Establish a Chauffeur's Bureau.

BUFFALO, Oct. 22.—It is the intention of the Automobile Club of Buffalo to establish a chauffeurs' reference bureau for the benefit of its members. The idea is to have every chauffeur register with the club, giving a record of his experience, age, habits, etc., together with references. It is expected the bureau will prove of great value to both employers and employed, and will raise the standard of quality in the ranks of local chauffeurdom.

Charles Clifton, treasurer of the Automobile Club of Buffalo, presented his resignation at the last meeting of the board of directors, and Seymour P. White was elected to fill the vacancy. Mr. Clifton has been ordered to take a European trip by his physician, and will be absent several months.

The silver medals awarded to Percy Pierce, George M. Davis, Gus G. Buse, and Archie Hughes, all members of the club, for perfect scores in 1906 Glidden tour, have arrived. The trophy, which was won in 1905 by Percy Pierce, is still retained in the custody of the club.

Kansas City Has Its Park Roads Oiled.

KANSAS CITY, Mo., Oct. 22.—Resolutions commending the park board for having the boulevards sprinkled with oil were adopted at the last meeting of the Kansas City Automobile Club. The club members believe that the oil-sprinkling system has an advantage over the use of water for street-sprinkling purposes, as the former proves as satisfactory in settling the dust, while the latter tends to wash away the fine gravel from the macadam paving, leaving it rough.

A Tie in the Rochester Hill Climb.

ROCHESTER, N. Y., Oct. 20.—West Dugway Hill, in Penfield, was the scene this afternoon of the second annual hill climb of the Rochester Automobile Club. Despite the heavy rain of Friday, the hill was in excellent condition, and it was expected that a new mark for climbing the hill would be established; but none of the drivers could quite come up to last year's figures. The course between start and finish was well guarded, and the affair was without accident.

Chief interest was manifested in the free-for-all event, in which five cars started. William Knipper, driving a Thomas car, and J. P. Grady, in a Pope-Hartford, each made the course in 51 4-5 seconds, and, as a result, there was a spirited argument as to whether the two cars should be sent over the course a second time. The crowd, thinking the events were over, overflowed the course, and it was impossible to run off the tie. The matter is now in the hands of Referee Harry S. Woodworth, who will announce his decision in a few days. Mr. Hart, owner of the Thomas car, has filed a claim for the prize. Mr. Thompson, owner of the Pope-Hartford, it is said, will make no further attempt to secure the prize.

One of the best exhibitions of driving given during the afternoon was that of Arthur Demler, who drove a Pope-Toledo in the event for cars rated from 23 to 30 horsepower. More cars were driven by owners to-day than was the case in last year's races, and the total entry was larger by about a dozen cars.

The following is a summary of the events and results:

CLASS I.—16-HORSEPOWER AND UNDER.

1. Franklin, 12-h.p.; owner, T. R. Finucane; driver, R. G. Finucane 1:13 2-5
2. Franklin, 12-h.p.; owner, Arthur McNall; driver, R. Foote 1:19

CLASS II.—17 TO 22-HORSEPOWER, INCLUSIVE.

1. Ford, 18-h.p.; owner, T. J. Northway; driver, N. B. Stetsel 1:07
2. Stevens-Duryea, 22-h.p.; owner, G. C. Buell; driver, John Kelley 1:10
3. Franklin, 20-h.p.; owner, Arthur McNall; driver, R. Foote 1:12 2-5
4. Franklin, 12-h.p.; owner, T. R. Finucane; driver, R. G. Finucane 1:13
5. Buick, 22-h.p.; owner and driver, C. L. Whiting 1:13 4-5
6. Buick, 22-h.p.; owner and driver, C. W. Voshal 1:14 2-5

CLASS III.—23 TO 30-HORSEPOWER, INCLUSIVE.

1. Pope-Hartford, 24-28-h.p.; owner, Foster & Armstrong; driver, Arthur Demler ..... :54 1-5
2. Ford, 18-h.p.; owner, T. J. Northway; driver, N. B. Stetsel 1:05 1-5
3. Franklin, 12-h.p.; owner, T. R. Finucane; driver, R. G. Finucane 1:10
4. Columbia, 24-28-h.p.; owner and driver, W. J. Graham 1:13 4-5
5. Haynes, 30-h.p.; owner and driver, A. V. Hart 1:15 1-5
6. Franklin, 12-h.p.; owner, Arthur McNall; driver, R. Foote 1:19 3-5
7. Corbin, 24-h.p.; owner and driver, John N. Heberger 1:21 2-5

CLASS IV.—31 TO 40-HORSEPOWER, INCLUSIVE.

1. Pope-Toledo, 40-h.p.; owner, Foster & Armstrong; driver, Arthur Demler ..... :59
1. Ford, 40-h.p.; owner, T. J. Northway; driver, John Meiser ..... :59
2. Royal Tourist, 40-h.p.; owner, A. O. Fenn; driver, Rowe. 1:13
3. Stoddard-Dayton, 30-35-h.p.; owner and driver, Carl W. Storandt 1:17 3-5

CLASS V.—ABOVE 40-HORSEPOWER.

1. Stoddard-Dayton, 30-35-h.p.; owner and driver, C. W. Storandt ..... :57 3-5
2. Thomas, 50-h.p.; owner and driver, A. V. Hart 1:06 4-5
3. Stearns, 45-50-h.p.; owner and driver, John S. Bingeman 1:15 3-5

SWINGING ROUND THE DOUBLE CURVE OF THE HILL.

CLASS VII.—FREE-FOR-ALL, INCLUDING RACING AND STRIPPED CARS.

1. Thomas, 60-h.p.; owner, A. V. Hart; driver, Wm. Knipper ..... :51 4-5
1. Pope-Hartford, 24-28-h.p.; owner, Robert Thompson; driver, J. P. Grady..... :51 4-5
2. Pope-Toledo, 40-h.p.; owner, Foster & Armstrong; driver, John Meiser..... :56
3. Stoddard-Dayton, 30-35-h.p.; owner and driver, C. W. Storandt 1:02 2-5

CLASS VIII.—ALL ELECTRICS.

1. Babcock; owner and driver, George J. Bauer.....1:55
2. Columbus; owner, T. F. Adkin; driver, Vernon Adkin...2:04 1-5
3. Columbus; owner and driver, A. V. Hart.....2:33 1-5

Akron, O., to Have an Automobile Club.

AKRON, O.—Andrew Auble, one of the officers of the Ohio State Automobile Association, and an enthusiast, predicts that this city will have over a hundred new machines next year. "The automobile season will open three months earlier than in former seasons, and new machines will be purchased in December, instead of March or April," he says. "The 1907 models will be for sale before December." He predicts that an automobile club will be formed before the advent of spring, and says a meeting is to be called in the near future in order that the automobile owners of the city may get together and organize. Mr. Auble thinks that a club would do the city great good, not only in advertising it, but in securing good roads. He has just returned from a visit to the Winton, Oldsmobile, Packard, Thomas and other factories which he represents in this vicinity.

New York Motor Club to Move on November 1.

NEW YORK, Oct. 22.—Last week the directors of the New York Motor Club settled upon new quarters for the club, and after November 1 the club rooms will be situated at 300 West Fifty-eighth street, close to Columbus Circle, in the restaurant and hotel building known as Reisenweber's. The opening of the new club rooms will be celebrated November 1 with a club smoker, and on the following day will be instituted a series of club luncheons. It is expected these club luncheons will prove a popular place for daily meetings for those prominent in the automobile trade, including the representatives of the press.

In spite of reports to the contrary, it was decided by the directors to hold the economy test about the middle of November, a number of manufacturers and their representatives having agreed to make entries.

The resignation of R. H. Johnston as chairman of the entertainment committee was accepted with deep regret, and Walton H. Flinn was appointed his successor.

CLUB DOINGS IN GENERAL.

WOODSTOCK, ILL.—The McHenry County Automobile Association held a very successful run to Beloit, Wis., October 14. There were twenty-five cars in the party, carrying an average of four people each. The autoists dined at the Hotel Hilton, Beloit, prior to their return.

MILTON, PA.—The Automobile Club of Central Pennsylvania, which gathers its membership from the counties of Northumberland, Lycoming, Montour, Union, and Snyder, has elected the following officers for the ensuing year: President, F. A. Godcharles; vice-president, W. L. Smindle; secretary, F. R. Slifer; treasurer, E. B. Piper.

NEW YORK.—Members of the Automobile Club of America have been warned by Secretary Butler that speed regulations are being rigidly enforced at Elmsford, on the Saw Mill River road, eight and one-half miles north of Yonkers, in Westchester county, and on the Albany post road, near the Poughkeepsie Rural Cemetery, about five miles south of Poughkeepsie.

CONTESTANTS WAITING THEIR TURN IN THE ROCHESTER HILL CLIMB—STARTERS BARRY AND BENTLEY COMPARING NOTES.

THE AUTOMOBILE

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The First of Many Automobile Speedways. It would appear that Long Island is to have the first American automobile speedway, and in designating it as a speedway it must not be thought that it is intended solely as a race course; in fact, its use for racing purposes will be of a secondary nature. The construction of this automobile highway will mark an epoch in the history of American roadmaking, for it will be the first thoroughfare of the many that will follow in course of time intended solely for the use of motor-driven vehicles. In order to utilize to the fullest extent the time-saving possibilities of the automobile there must be these special roads with an unopposed right of way, with no crossroad handicaps, no horse-drawn vehicles and no pedestrians.

Unquestionably this furtherance of Utopian independent transportation of the individual may bring about sooner or later more or less opposition from railroad interests, which are bound to be affected in the long run. It would not be an improbable sequence if the universal construction of automobile trunk roads, fed by many tributary highways, would bring about a lessening of the talk of government ownership of the railroads, for with the people themselves owning the highways and everyone privileged to drive his own automobile, the acme of unrestricted travel would appear to have been attained. Of course on these same roads there would come in the course of time public 'buses, luxuriantly made and fully as comfortable as the railroad coaches of to-day.

The work is only begun, and what will have been accomplished in the next ten years in this fertile field will astound even those who are surcharged with optimism when considering its vast possibilities. All forms of passenger and freight transportation some day will be motor driven, and the day is not very far distant. The progress of the past year has been substantial and permanent, and if there are doubting Thomases having no faith in the grand future of the motor-propelled vehicle they are certainly in hiding and had better remain in obscurity and not foolishly talk of the collapse of the "auto boom," for no boom exists, and there is nothing except a steady progress that bears the earmarks of permanency and prosperity. The Long Island speedway tells its own story, and tells it clearly and positively in no uncertain manner.

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The Future of Two-Cycle and Four-Cycle Engines. Despite the apparent stability of the present established cycles of internal-combustion-engine operation, there is no feature of accepted automobile practice holding greater promise of future improvement. Narrow as has seemed the field for modification, and stable though present constructions may seem to be, there are two significant facts that dominate the situation, and which can be neither denied nor evaded. First of these is the admitted shortcomings of all standard automobile-engine designs, contrasted with which is the second—the unquestionable superiority of the best stationary gas engine practice.

The shortcomings are so universal as to need only to be listed. With the four-cycle there is the exhaust at high pressure, detracting from highest fuel efficiency and necessitating the exhaust pipes and muffler, besides making for retention of heat, which in turn involves the elaborate and otherwise very undesirable cooling system. With the two-cycle there is the impure charge, full of burnt gases, and the lack of working efficiency throughout a considerable range of speeds. Also, there are the crankcase troubles, known to every expert and many a novice. These are the more serious defects that suggest themselves.

Finding fault, of course, does not of necessity constitute the means of its correction, but it does very often point the way to its correction.

That improvements to come must lie substantially in the direction of present stationary gas engine practise can be doubted by no one who takes the trouble to look into the situation. There are stationary gas and liquid fuel engines, in single-cylinder, single-acting units ranging as high as 500 horsepower, in which practically every one of the most pressing problems of the modern automobile engine are solved satisfactorily. Not that there is any single engine in which all these possible ideals are embodied, but there are engines in which individual improvements exist, which, if a way were evolved of combining them, would be far in advance of what is at present conceived to be possible. There are gas engines, for instance, developing as much as 100 horsepower which are satisfactorily air-cooled without even the usual provision of air jackets or cooling members. There are other gas engines that carry the terminal pressure almost down to atmosphere before exhausting the charge. Others still do absolutely away with the carbureter, and all of its almost insuperable problems. And in others the matter of ignition is worked out to a basis of practically perfect reliability.

The prospects for immediate or early realization of many of these ideals may seem upon first consideration remote, but there is work going on in the experimental shops of some of the most advanced automobile constructors of the time which argues otherwise. Some anticipations of forthcoming developments along the lines suggested herein will be found in Mr. Malcolm's article commencing in this issue of THE AUTOMOBILE. Following this we hope to publish a series of articles in which some even more interesting material will be incorporated.

N. A. A. M. TO HAVE CONTEST.

At the November meeting of the Executive Committee of the N. A. A. M. a report will be presented from the Contest Committee advising the national body to hold a contest of some kind in the spring or early summer of 1907. Recently the committee sent a circular letter to the members of the N. A. A. M. asking for their views on the question of a long tour or contest next year. A most substantial grist of replies was received and these were considered at the meeting of the committee held on Tuesday last at the N. A. A. M. offices, No. 7 East Forty-second street, New York City.

The circular very completely covered about every possible point in connection with the running of a contest, and in its report to the Executive Committee will be embodied a consensus that can be used as a basis in adopting the final rules, for the framing of which the Contest Committee will do more or less recommending. While nothing definite can be stated at this time, it is more than probable that the various classes of vehicles will be provided for and a runabout will not be asked to compete against a big touring car. Of course this will mean that there will be several prizes instead of one prize such as is given in the annual A. A. A. tour for the Glidden trophy.

Those present at the Tuesday meeting were President E. H. Cutler, of the N. A. A. M., and the members of the Contest Committee: S. T. Davis, Jr., S. D. Waldon, Windsor T. White, Albert L. Pope and L. H. Kittredge. General Manager S. A. Miles was also in attendance.

WEBB WINS WITH PREMIER RACER.

INDIANAPOLIS, IND., Oct. 20.—What was probably one of the best automobile race meets ever seen in this city was given to-day by the Indianapolis Automobile Racing Association, when the one and five-mile records of the Indiana State Fair Grounds track were broken. The proceeds of the meet were given to the family of Patrolman Charles J. Russell, who was murdered with another patrolman by a negro desperado three weeks ago. The family of Russell was left destitute, and the automobile men were the first to go to their aid. After the garages and factories had furnished automobiles to the police for the purpose of hunting the murderer, they arranged the meet for the family.

The feature of the afternoon was the five-mile open race, when, in the second heat, the 100-horsepower Premier racer broke both the one and five-mile records of the track. A 60-horsepower National, and the 100-horsepower Premier, driven by A. C. Webb, contested. The time of the winning Premier was 4:55 1-5, the third mile being run in :57 4-5. The previous record of the track for one mile was :58 1-5, held by Barney Oldfield in his Green Dragon. The time of the third heat, which was between Webb and Freiberg, was 5:57 1-5, Webb winning.

For runabouts costing $1,000 and under, Thomas E. Madden was the winner with a 22-horsepower Buick. The ten-mile event for stock touring cars costing over $2,000 was won by Tom Kincaid with a 40-horsepower Matheson. The same car and driver also won the ten-mile event for stripped stock cars. The five-mile handicap was appropriated by Jap Clemens driving a 60-horsepower National.

DETROIT'S 1907 AUTO PRODUCTION.

DETROIT, MICH., Oct. 22.—Although the New York shows, which mark the formal opening of the season, are still distant, activity is everywhere in evidence in the local automobile world, and every effort is being directed toward getting in shape for next year's trade. In point of production, Detroit is far and away the leader. No less than a score of factories are located here. On every hand there are evidences of prosperity, and manufacturers are unanimous in the prediction that last year's record, when the total value of Detroit's output of automobiles exceeded $10,000,000, will be shattered by a comfortable margin, some even asserting that the 1907 production will reach $15,000,000.

SELDEN MOTOR VEHICLE COMPANY.

ROCHESTER, N. Y., Oct. 22.—George B. Selden, inventor of the Selden gasoline automobile, has organized a company, to be known as the Selden Motor Vehicle Company, with a capital of $500,000. An alliance with the Buffalo Gas Engine Company secured for the new company a license in the Association of Licensed Automobile Manufacturers. The plant of the new concern is to be located at Despatch, N. Y., and will cost between $35,000 and $40,000.

The following men are said to be interested in the new company: George B. Selden, George G. Foster, Gilbert E. Mosher, Frank D. Russell and R. H. Salman, all of Rochester, and L. A. Fischer and A. Snyder, of the Buffalo Gas Engine Company. A few weeks ago there was a rumor regarding the new company circulated in this city. The Rochester representative of THE AUTOMOBILE called on Mr. Selden at that time and asked him if the rumor was founded on fact. Mr. Selden then replied: "There is nothing to it."

PHILADELPHIA'S HOMELESS AUTO SHOW.

PHILADELPHIA, Oct. 22.—"Where shall next winter's show be held?" is the question now agitating the members of the Philadelphia Automobile Trade Association. The Export Exposition building is no longer available, the Almshouse authorities having taken it over as an annex to relieve the overcrowding of the main building. Any one armory in the city is much too small, and it is proposed to divide the exhibition.

Some advocate a combination "open-house week" of all the establishments on the row in place of a show, but this is objected to for the reason that it will attract too many of the "something-for-nothing" element, who would be in the way. Besides, the dividend sure to be declared would be lost—quite an item in meeting the expense of decorating, etc. The Show Committee, consisting of W. J. Foss (Pierce), Wayne Davis (Packard), H. P. Stillman (Mercedes), H. Leeds (Studebaker), and W. F. Smith (Rambler), are seeking a solution of the intricate problem.

WHAT A TRANS-STATE TOUR ACCOMPLISHED.

YORK, PA., Oct. 22.—Joseph W. Hunter, State Highway Commissioner, one of the Pennsylvania Motor Federation tourists who passed through this city a short time ago on the trip over the proposed state road between Philadelphia and Pittsburg, arrived here again the other day and had a long conference with the County Commissioners. Before Mr. Hunter left contracts were let for the improvement of several of the most frequented roads in this part of the Keystone State.

The trip of the state autoists through to the Smoky City was productive of good results to all sections. From the West come the reports that Commissioner Hunter and the party did a great deal of good roads campaigning. The main thoroughfare between Philadelphia and the National Cemetery, at Gettysburg, which run is always popular with the autoists, is to receive the first attention.

SPRINGFIELD CLUB ENTERTAINS THE POLICE.

SPRINGFIELD, MASS., Oct. 20.—Last week the chiefs of police and delegates from many cities and towns in Massachusetts held here their annual convention of the Massachusetts Police Association. The Automobile Club of Springfield conceived the idea of showing them the city in automobiles, and incidentally pour a "little oil on the troubled waters." Dr. V. J. Irwin, W. J. Anderson and C. E. A. Cameron were appointed a committee to take charge of the affair, which was a huge success, some twenty-five cars participating. The officers, many of whom had never been in an automobile before, were shown the city, and instructed as to how the cars were operated. At the police banquet the following day, the committee and President S. L. Haynes were guests, and many comments were extended by the speakers on the club's efforts.

THE FIRST GARDEN SHOW.

Of the thousands who will attend the seventh annual automobile show in Madison Square Garden during the week of January 12 to 19, there will be few who will know who was responsible for the first automobile exhibition held in this country. It was James P. Young, the secretary and treasurer of the Madison Square Garden Company, who, away back in 1900, first grasped the future development and great importance of the automobile industry. How Mr. Young came to his conclusion, and how hard he fought until he succeeded in putting on the first automobile show, in November of 1900, will be of intense interest to the present-day automobilist.

JAMES P. YOUNG.

It was from 1894 to 1898 that the bicycle craze and industry were at their height in this country. In each of these years a colossal bicycle show was given in Madison Square Garden. Toward the close of the nineteenth century, however, the bicycle fever, which had made pedal fanatics of half the country's population, began to wane, and the management of the bicycle show found it difficult in 1899 and 1900 to fill the garden with exhibits.

The last bicycle show was held in January, 1900, and the late Frank W. Sanger, the general manager of the Madison Square Garden Company, which gave the show, persuaded a dozen automobile concerns to make exhibits, as the bicycles were not sufficient to fill the garden. It was during this show that Mr. Young strolled into the Garden and noticed that nearly all the spectators were grouped around the automobile exhibits, while the bicycles were almost deserted. Then and there in the fertile brain of Mr. Young the automobile show had its birth.

He at once proposed to Mr. Sanger that the Madison Square Garden Company give a show exclusively for automobiles. The latter, however, frowned upon the project, saying that the industry was too young. Mr. Young, however, nothing daunted, went ahead with his plans during the winter and early spring of 1900. In February, Mr. Young received a letter from the Automobile Club of America, asking on what terms he would consent to put on an automobile show. Nothing, however, came of these negotiations. He made a list of the automobile concerns which had exhibited in the last bicycle show, and asked them if they would go into a show exclusively for automobiles. All were enthusiastic over the new project.

Frank K. Sturgis, the president of the Madison Square Garden Company, dropped into Mr. Sanger's office one afternoon while Mr. Young was urging his pet hobby. A general discussion on the advisability of an automobile show and its possible success followed. Mr. Young advocated the show with great vigor. Mr. Sanger was afraid there were not enough automobile concerns to fill the Garden. Mr. Young urged the scheme, and Mr. Sturgis said: "You are certainly very enthusiastic over this, Mr. Young," and then and there it was agreed to give the show.

The Automobile Club of America agreed to co-operate with the Madison Square Garden Company, and help sell the space. When the first call for exhibitors went out in June of 1900 only a dozen manufacturers sent favorable answers, and these were mostly the concerns which had exhibited in the last bicycle show. It looked as if the first automobile show would have to be conducted at a heavy financial loss, and might even prove a failure. Small wonder that Mr. Young felt blue. He kept steadily at work all summer, however, and one by one the manufacturers were hauled into line. Personal solicitation was required in many cases, and often it was like pulling teeth to get them in. These were strenuous days for Mr. Young, but he had guaranteed the success of the show, and he kept at the task until success crowned his efforts.

A. C. A. COMMERCIAL VEHICLE TEST.

Entry blanks, rules and regulations for the forthcoming commercial vehicle contest of the Automobile Club of America have been issued, together with maps of the route and all information necessary for the guidance of entrants. The contest will extend over a period of four days, from November 7 to 10 inclusive, and the cars will travel 40 miles a day. Entries will be received up to November 1 by Secretary S. M. Butler at the A. C. A. clubhouse, 753 Fifth avenue, New York, and all entries must be accompanied by the entrance fee of $25. The winner of the contest will be awarded a silver cup, and all other contestants will be given certificates of performance. Awards will be made on the basis of cost of operation per ton mile of paying load—that is, the car that hauls its load at the lowest cost per ton over the specified distance will take the cup.

Following are the essential features of the rules and regulations issued by the Contest Committee of the club:

Contestants are assumed to be acquainted with and to agree to abide by the rules; disputes regarding their interpretation shall be decided by the Contest Committee. Contestants assume all responsibility for damage or injury caused by their machines during the competition.

All types of motor wagons may be entered, whether made in the United States or abroad. The Club Secretary will forward blanks on request.

The entry list will close November 1. Entrants must state weight of car with fuel, supplies and equipment on board; maximum load capacity; fuel capacity; name of manufacturer and place of manufacture; make and size of tires; motive power; rated horsepower; number and size of cylinders, and gear reduction. Entrants of electric vehicles must give weight of battery, number of cells, volts per cell and ampere hour capacity.

The entrance fee of $25 must be forwarded with entry and will be retained by the Club if the vehicle fails to start or is disqualified. A full description and photograph of each vehicle must accompany the entry.

All vehicles will operate in the same class, whether gasoline, steam or electric. Each vehicle must carry a dead load equal to 50 per cent. of its own weight with all supplies, driver and observer on board. Contestants will furnish their own dead load, which may be of any desired character and will be weighed and checked by the Contest Committee.

The route will be as follows: Club house to Fort George and return by way of Washington Bridge, Jerome avenue, Seventh avenue. This makes 20 miles, the first stage. Second stage, Clubhouse to the Battery and return, 10 miles. Third stage, repetition of second, making a total of 40 miles.

The club will furnish an official observer for each vehicle, who shall note all details of performance. No repairs must be made without the observer's knowledge.

Official numbers will be furnished by the club. Entrants may attach such signs as they please, which should state name of maker and weight of load.

Vehicles must report at the weighing station at 8 a.m., November 7, with all supplies and equipment and load on board, ready to run. Cars will be weighed and checked and fuel measured and will then line up on Fifty-eighth street, irrespective of numbers, and will be started at three-minute intervals. Current readings of electric vehicles will be taken.

Fuel will be furnished by contestants. Its cost will be charged against the vehicle, together with cost of repairs, charging labor at 50 cents an hour and repair parts and material at retail prices. Solid fuel must be carried in bags or other convenient manner, so it can be measured or weighed.

Vehicles must be brought before the Contest Committee on November 5 for official weighing and checking. Must be fully equipped for the road and have full tanks, but no load. Numbers will then be assigned.

The committee will provide a garage where the vehicles must be stored each night during the contest, in the custody of a club official.

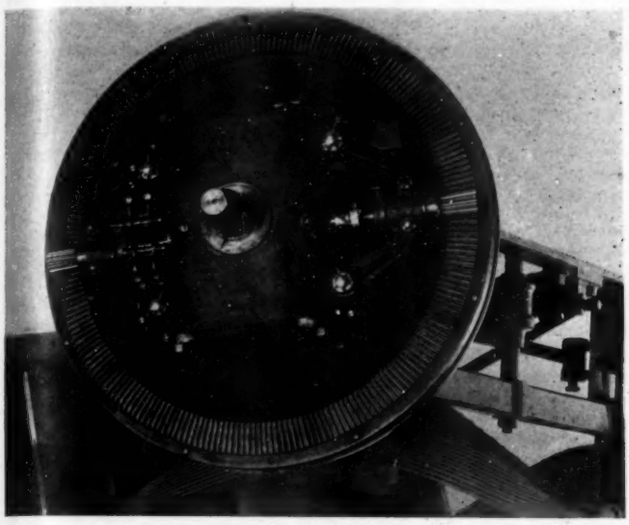
Passengers in addition to the driver and observer may be carried if the entrant desires, but they will not be included in the dead load.

On the first day of the contest vehicles must cover the route without voluntary stops. On the second day stops to be specified by the committee are to be made. On the third day the vehicles will cover the same route without load without voluntary stops, and on the fourth and last day the vehicles will cover without load the same route, making stops to be specified.

The Contest Committee consists of John A. Hill, E. T. Birdsall and A. H. Whiting.

WILL CARRY TELESCOPE UP MT. WILSON

WHAT is probably one of the most remarkable self-propelling vehicles ever made has just been turned out of the shops of the Couple-Gear Freight Wheel Company, of Grand Rapids, Mich., licensees under the Holson motor patents. It is a monster automobile truck designed and built for the purpose of transporting the greatest telescope ever constructed. The telescope is the big instrument being manufactured for the Solar Observatory



INNER HALF OF WHEEL SHOWING MOTOR.

of the Carnegie Institution of Washington, D. C., which observatory is located at the top of Mount Wilson. The telescope is being constructed in extensive shops located at Pasadena, Cal., which is within a few miles of the mountain. Three years have been consumed in grinding the great lens of the instrument, which will have a diameter of 60 inches. The objective of the Yerkes telescope, now the largest in the world, has only a diameter of 40 inches. The huge mass of optical glass weighs a ton in itself, and some of the castings of the instrument are very heavy, the base alone weighing five tons.

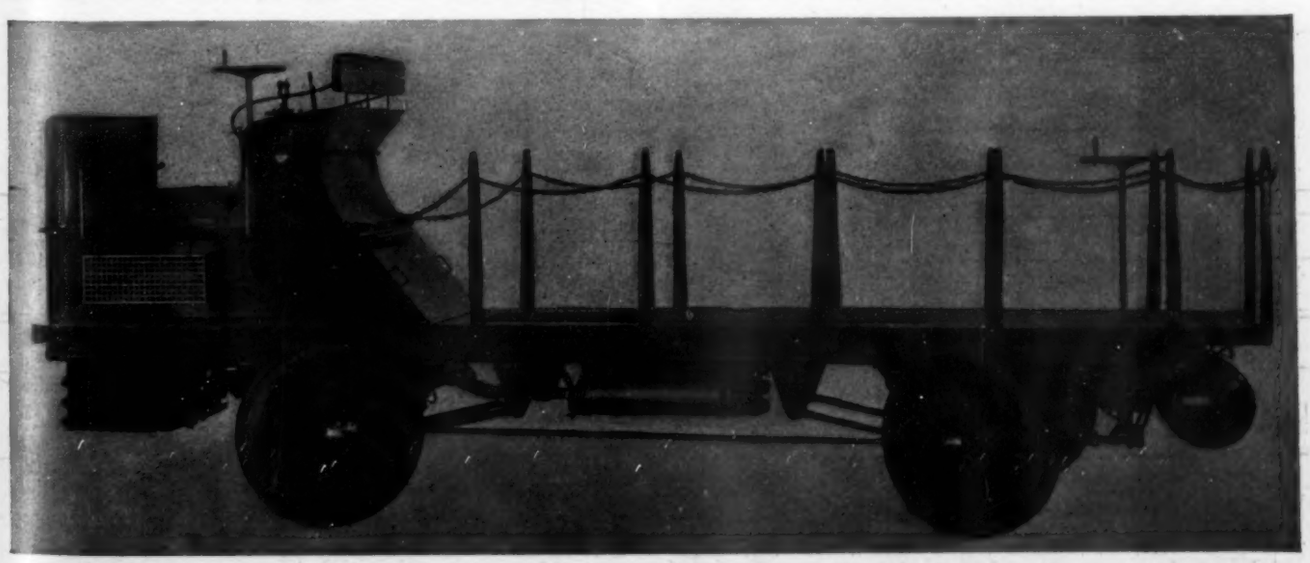
To carry the parts of this great star-gazing apparatus to the top of the mountain was a problem that seemed to challenge solution. Gasoline motor-driven trucks were thought of, also a railroad, but a score of seemingly feasible plans were rejected as impracticable by G. W. Ritchey, superintendent of instrument construction. The plan of a gasoline-electric couple-geared automobile truck was finally decided upon, and the order for the car was placed some three months ago.

The sum of $25,000 is being expended in making a roadway to the top of the mountain. The trail is rough and precipitous, there are sharp turns and deep declivities, and in places the roadway shelves towering walls of rock and overlooks chasms 1,000 feet in depth. These are the conditions that are confronted, the obstacles that are to be surmounted.

The truck built to do the work differs from the other trucks of the manufacturers in many ways, but the principal innovation is the employment of a dynamo direct-connected to a gasoline motor to take the place of the usual storage battery in supplying current to the motors. This arrangement is made because of the conditions, especially the distance from a charging plant. The motors are of the style peculiar to these couple-geared vehicles, individual motors located inside of the wheels. Power is applied from both ends of the armature shafts by pinions engaging circular racks on either side of the inner walls of the wheels, thus eliminating thrust. The steering gear operates simultaneously both front and rear pairs of wheels in opposite directions, making the vehicle specially adapted for the short turns to be encountered, some of which form an arc with a radius of but 15 feet. Another advantage lies in the convertibility of the motors into generators when descending grades, making the motors act as electrical brakes, and avoiding the wear and tear incidental to the use of mechanical or friction brakes.

The gasoline engine is of 40 horsepower and the four motors are each of 4 horsepower, but are made to work under a heavy overload when required. The car is expected to make a speed of 12 miles per hour on a level when fully loaded, or about two miles per hour in ascending the steep grade of the mountain road. The latter will rise 5,000 feet in a distance of nine miles. The average load of freight carried in moving the telescope will be five tons. No attempt was made to secure anything in the way of speed, but the object was to provide power and apply it in a method that would meet the requirements of these conditions.

The central part of the truck is cut away to allow the loading of the heavy base casting of the telescope, the one weighing five tons, which adds to the unique appearance of the vehicle.



SPECIAL COUPLE-GEAR AUTOMOBILE TRUCK FOR CARRYING GIANT LENS UP MT. WILSON, CAL., TO THE CARNEGIE OBSERVATORY.

LONGSTRETH WINS QUAKER CUP.

PHILADELPHIA, Oct. 22.—Over roads in some places hub deep in the mud, and in the teeth of a howling gale, accompanied at intervals by drenching rain, W. C. Longstreth, driving a 50-horsepower Maxwell car, managed to finish first in the annual cross-country run of the Automobile Club of Philadelphia after half of the original thirteen entrants had been scared out of the contest by the unfavorable weather conditions. His total time was 5 hours 54 minutes, but as the intervals spent at the controls, according to the rules of the run, are to be subtracted, his exact time will not be known until all the checkers' reports are turned in and verified.

Seven cars lined up for the start—two Maxwells and two Thomases being placed on scratch; a Buick, a Stanley, and a Maxwell runabout being given allowances of 15, 35, and 105 minutes, respectively. The handicaps were according to power, and cars over 24 horsepower had to carry five; under 24, four, and under 14, two passengers. The first car to start, G. L. Mayer's 50-horsepower Thomas, had but one seat, the car being of the turtle-back variety. Three of its occupants were compelled in consequence to stow themselves away as best they could. They had the time of their lives, hanging on for dear life as the Thomas took the Bucks county thank-ye-ma'ams at speed. They stuck gamely to the finish, however. Mayer was sent away at 7:57 A.M., followed at intervals of five minutes by the others.

The peculiar feature of a "cross-country" run is that, barring the necessity of reporting at specified points for checking purposes, the contestants are not restricted as to choice of roads. Besides the clubhouse at 1409 Walnut street, Philadelphia, the checking stations selected were Doylestown, Quakerstown and Pottstown. Between controls previous experience or the usually unreliable information of the inhabitants of cross-roads villages governed the routes chosen by the contestants. Those who relied on the latter, as usual, lost their bearings. Especially between Quakerstown and Pottstown was this the case, not a few of the drivers getting miles out of their way in an effort to beat out the others. As one of them said: "There is no best route between Quakerstown and Pottstown."

What with following blind trails and tire troubles, C. W. Kelsey, whose experience made him a favorite, lost much time, he consuming nearly four hours covering the Quakerstown-Pottstown leg. Mayer also lost quite a little time endeavoring to steal a march on the others by taking a "short-cut." It was the kind of going when the "longest way around is the shortest way there." Longstreth more than made up the 23 minutes' start which Mayer had, owing to the latter losing himself in the network of muddy roads.

It had been arranged for the contestants and passengers to lunch at Pottstown, but Longstreth, after a short stop, pulled out of the control just as the mud-bespattered and tired "turtle-backers" on the Thomas came up. The latter were "all in," and concluded to take advantage of the one-hour allowance for relieving the cravings of the inner man and furbishing up the outer man a trifle. They needed the latter.

With a good lead, Longstreth took no chances on the fairly good roads on the last leg, and played in luck by getting almost home before the star downpour of the day set in. Mayer, an hour behind, and Kelsey, still farther in the rear, got the full benefit of it, the result being that Longstreth added still further to his lead, arriving at the finish 1 hour 9 minutes ahead of the Thomas. According to the rules, any car finishing after 4 o'clock was counted out. Kelsey just nosed in with three minutes to spare. The others finished as they pleased and were not timed. The summary:

Owner	Car	Start	Handicap	Finish
W. C. Longstreth	Maxwell	8:20 A.M.	Scratch	2:14 P.M.
G. L. Mayer	Thomas	7:57 A.M.	Scratch	3:23 P.M.
C. W. Kelsey	Maxwell	8:25 A.M.	Scratch	3:57 P.M.
T. K. Oguri	Maxwell	8:03 A.M.	1:45:00	Not timed
Horace Allen	Buick	8:10 A.M.	35:00	Not timed
D. W. Harper	Stanley	8:15 A.M.	15:00	Not timed
W. T. Smith	Thomas	8:30 A.M.	Scratch	Not timed

THE SELDEN POINT OF VIEW.

In the second of a series of articles being published in the *Engineering Magazine* by Edwin J. Prindle, of the New York bar, the writer deals with the subject of trade combinations under patents, and sets forth the extent to which patents legalize associations of manufacturers and sellers in a way that is of peculiar interest to the automobile industry, in view of the controversy among makers over the Selden patent. Mr. Prindle comments in this manner on the Association of Licensed Automobile Manufacturers:

"Manufacturers and importers of about 72 per cent. of the gasoline automobiles sold in the United States are combined by means of licenses under a certain patent. The licensees pay a small royalty, but that royalty is more than compensated for by the savings made possible in the conduct of their business by the co-operation with other manufacturers. They enjoy, among others, the following advantages from their combination. The association has agents throughout the United States who will sell the machines made by any member of the association, but they cannot sell unlicensed automobiles. Each member of the association has agreed not to aid or abet others in infringing the patent, wherefore he cannot deal with an agent selling an infringing machine, and this, although agents do not directly receive licenses, prevents their handling unlicensed machines. The association maintains a traffic department in charge of a specialist in that branch, an experienced freight-traffic manager, and through it secures for all automobile manufacturers and owners the proper and best freight rates and transportation facilities. The association arranges exhibitions and public tests for the benefit of its members, from which unlicensed manufacturers infringing the patent are excluded, as to admit unlicensed manufacturers would indirectly be an infraction of their covenant under the license not to aid or abet the infringement of the patent.

"The members of the association have monthly meetings at which there is an interchange of ideas in manufacturing, very greatly to the benefit of all the members. The association has agreed upon some standardization of parts and is gradually effecting more such economies. If several members of the association are threatened with suit under patents owned by those not members of the association, the association, through its concentration of information, is in a better position to judge promptly and well of the controversy and determine the best action to take to prevent mulcting of its members or to compensate worthy patentees fairly. The individual members of the association own over 425 patents. If one member finds that another member of the association is infringing his patent, the matter can be adjusted invariably, owing to intimacy and mutual understanding of the individual members, either by a discontinuation of the infringement or by the owner of the patent granting a license to the member who is infringing."

THE 1907 PLANS FOR THE WAYNE.

DETROIT, MICH., Oct. 22.—Although no formal announcement of its 1907 line has yet been made, the Wayne Automobile Company is erecting a large addition to its already immense plant in order to care for its rapidly increasing business. The new structure will be 56x214 feet on the ground, and three stories in height, giving something over 35,000 additional feet of floor space. It will be of the most modern type of construction.

Quietly, but with the utmost rapidity consistent with satisfactory results, work on the new 1907 Wayne models has progressed, until the point has been reached where information is vouchsafed concerning the line that will be put forth for the coming season. The features incorporated in the Model N, the new 35-horsepower car that it is planned to make the Wayne leader, will be of interest. Sliding gar transmission is employed, the gear being placed on the rear axle, thus making it impossible for it to get out of alignment, whatever the position of the car, and causing it to run as smoothly on the low speed as on direct drive. Transmission is of the selective type, three speeds forward and reverse, permitting instantaneous change to any desired speed. Two brakes are placed on each rear hub, acting independent of the transmission. The internal expanding brake operates by foot, and the external band by lever, insuring ample protection at all times. Although it is the intention to feature the Model N, the other types of touring cars which proved so popular last season will be continued by the Wayne company.

S. D. WALDON'S FOREIGN DEDUCTIONS.

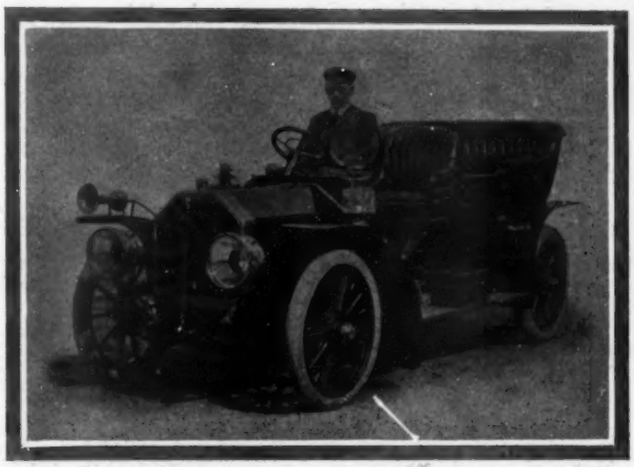
"Six-cylinder cars are a fad and of much over-rated consequence in the automobile industry, both of this country and of Europe." This unequivocal remark was made by Sales Manager S. D. Waldon, of the Packard Motor Car Company, when interrogated upon the subject after his recent return from a tour of the European automobile manufacturing centers. Mr. Waldon frankly admitted that one of the objects of his trip had been to gain a definite idea of the extent of the six-cylinder notion abroad. Continuing, he said:

"Like many other people in the American trade, I had, from current reading, gained the impression that Europe was a hotbed of six-cylinder germs. I thought that many of the most prominent factories were making their greatest designing effort upon cars of this type. I found, as a matter of fact, that six-cylinder cars are of no greater relative importance in the European industry than they are in the American trade. Particularly was I desirous to visit the factory home of an English six-cylinder car, which, on account of having won a notable road test, was commented upon and described and boosted in automobile papers of the whole world. I had seen it heralded far and wide in English, French, German and Spanish. I visited the sales headquarters, and was courteously shown through them. I saw no six-cylinder cars—just the standard fours. I asked the manager: 'Have you another establishment devoted to your six-cylinder cars?' He looked blankly at me a moment, smiled, and then said: 'Oh, we are not bothering much with six-cylinder cars. We built one to use in some tests, but our factory is entirely devoted to making four-cylinder cars.'

"It is early to discuss automobile shows, but I will venture the assertion that at both the New York and Chicago exhibitions the present six-cylinder activity will be found to have dwindled into the usual scattering of 'double-threes' or 'triple-twos' among the great volume of permanently recognized four-cylinder cars. It is sure for one thing that the Packard company has not been and will not be tempted into the by-path of this fad."

MOSHER SECURES A PIERCE CONTRACT.

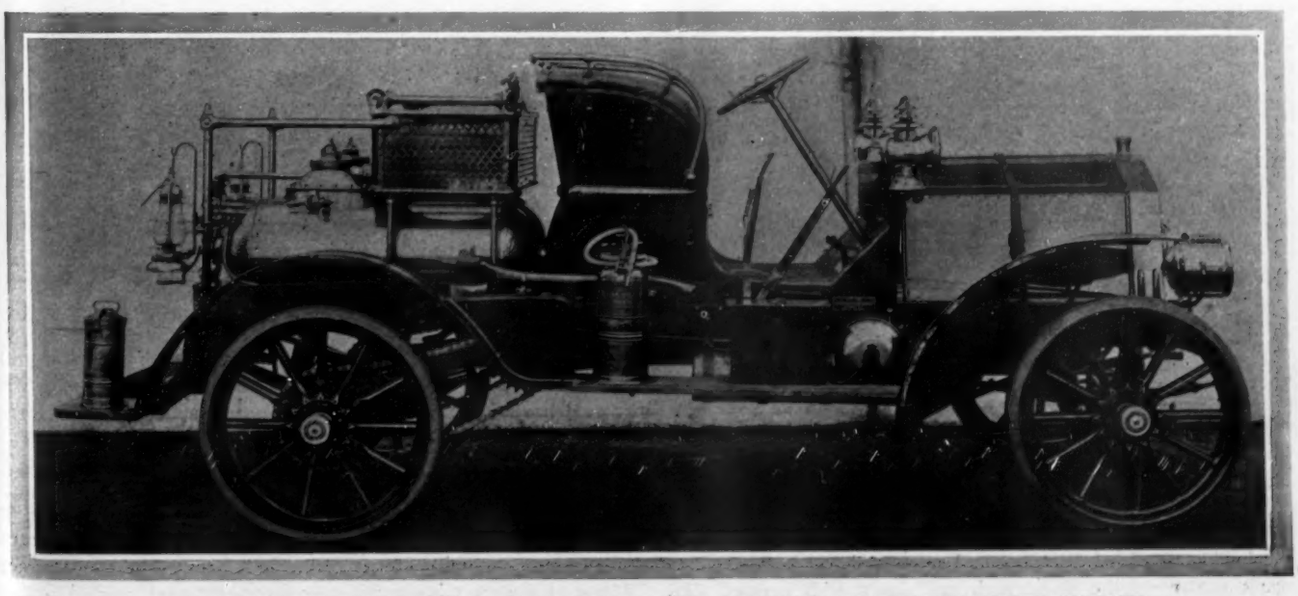
ROCHESTER, N. Y., Oct. 22.—M. E. Mosher, manufacturer of hardware specialties, has secured a contract from the George N. Pierce Company, of Buffalo, which calls for a complete Rochester automatic oil gun can equipment for every 1907 Pierce car turned out. It is claimed for the Rochester self-loading can that it is impossible to overfill, there is no waste of oil, and the lubrication reaches the working surface of the bearings effectually.



1907 PEERLESS MODEL 15 AND ITS DESIGNER, CHARLES SCHMIDT.

BOSTON'S NEW AUTO FIRE FIGHTER.

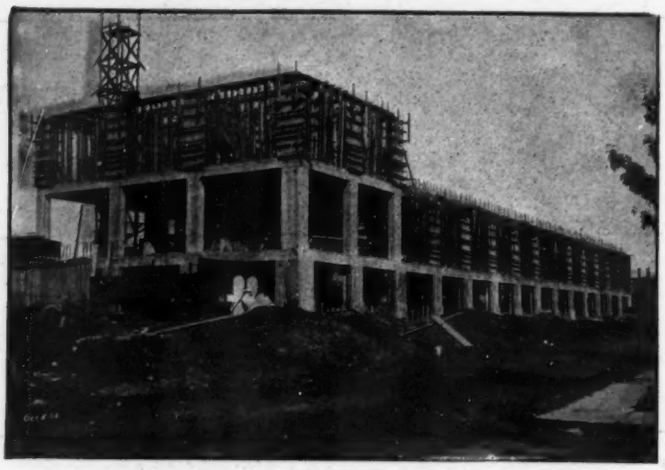
There is perhaps no more striking testimonial to the degree of reliability attained in the modern gasoline automobile than the use of the "new locomotion" for fire-fighting apparatus—a class of service where the utmost reliability and trustworthiness are absolutely necessary. The accompanying engraving shows an automobile chemical engine turned out by the American-La France Fire Engine Company, of Elmira, N. Y., and now in the service of the Boston Fire Department. Ordinary touring car lines have been adhered to in the design of the framing and propulsive machinery. The four-cylinder engine under the hood is rated at 28 horsepower and is water-cooled; ignition is by jump spark with battery as the source of current. A three-speed sliding gear of the progressive type is controlled by a single hand lever, and final drive is by double side chains to the rear wheel sprockets. The maximum speed is 30 miles an hour and the weight of the car, complete, is 4,600 pounds. The fire-fighting equipment consists of a complete chemical engine outfit, including two tanks each having a capacity of 35 gallons, small portable extinguishers, axes, lanterns and other necessary paraphernalia. The big gong on the right-hand side is of unmistakably fire-engine character. A wind shield in front protects the driver, and the hand rails on the front seat are very suggestive of the ability of the machine to take corners at high speed. Solid rubber tires are fitted to the wood wheels, as delays from tire troubles would destroy the usefulness of the machine to a prohibitive extent.



BOSTON'S AUTOMOBILE CHEMICAL ENGINE BUILT BY THE AMERICAN-LA FRANCE FIRE ENGINE COMPANY.

NEW WHITNEY PLANT AT HARTFORD.

Expansion is the order of the day among manufacturers of automobile parts and accessories, and the Whitney Manufacturing Company, of Hartford, Conn., is no exception to the rule. The accompanying illustration shows a new building in course of erection which will be completed and ready for occupancy about December 1. Owing to the large amount of work on hand and the



WHITNEY MFG. CO.'S NEW BUILDING IN COURSE OF ERECTION.

necessity for avoiding delay when moving from the old plant to the new one, there will be a period of about a month when the machinery in both buildings will be running, the new plant getting into the swing of the work—finding itself, as Kipling would say—and the new plant keeping up the productive capacity in the meantime. The Whitney company manufactures chains for automobile driving purposes and has an enormous business in this line, in addition to other metal specialties. A number of improvements in machines and manufacturing methods are being made, so that the company expects to make even better specialties in the future than in the past.

PRESSED STEEL FRAME AND BODY.

PARIS, Oct. 15.—Enrique Sanchis, a Spanish engineer, has built recently a very curious type of automobile, in which the body frame and chassis are of pressed steel manufactured in the same piece. The body frame is characterized by this fact, that each flask constitutes the entire lateral part of one side of the car, and forms the organs of support of the whole vehicle. With this system the bonnet support, the bridges of the motor, the board

SANCHIS' COMBINED BODY AND FRAME OF PRESSED STEEL.

columns, the whole suspension system, etc., are obtained in one piece with the chassis.

The inventor claims for his invention many advantages, which principally are added lightness and greater rigidity. The empty spaces shown on the photograph are closed with pressed steel panels by the coachmaker at the time of his work.

BUSINESS HAPPENINGS AT AKRON, O.

AKRON, O., Oct. 22.—Tire manufacturers of this city are very busy preparing for next season's business, and report a bright outlook. Although the Diamond Rubber Company was disappointed that none of the American cars gained winning positions in the Vanderbilt Cup race, it has no kick coming as the result of the contest, and this week reported over $1,000,000 worth of tire contracts for the season of 1907 closed since the race. Most of these were with automobile manufacturers. The local companies will be in the big shows next winter deeper than ever.

So far Akron hasn't landed the plant of the Williams Motor-Carriage Company, makers of H. W. Williams' gasoline car of entirely new design. The company has purchased the Blakeslee plant in Cleveland, where it is turning out several cars a week, electric and gasoline. Twelve families have moved from here to Cleveland on account of the plant starting there. The company will have 65 men at work in a few weeks. The permanent location of the plant depends on where most of the remaining $61,000 of the company's bonds will be floated.

The B. F. Goodrich Company is enlarging its huge plant by adding three new buildings. The largest is a six-story reinforced building, 100x100, to be used for storage purposes, and to be completed by December 15. Another is a six-story concrete press building, which is nearly finished. Work will be commenced shortly to build an underground storehouse, with a subterranean depth of fourteen feet, and to be connected with the surface by an elevator only.

It is believed that the Panama Crude Rubber Company, recently incorporated by Akron attorneys, will erect a plant in Youngstown, this state, which has been practically settled upon as the site for the plant, although other cities are after it hard.

EUREKA A PACIFIC COAST PRODUCT.

SEATTLE, WASH., Oct. 22.—The Eureka Motor Company has been incorporated with capital stock of $50,000. This will be the first attempt on the North Pacific coast to build automobiles. The company has secured the trans-Mississippi rights for the Dio motor. The Eureka company has purchased the shop, machinery, and location of the Seattle Manufacturing and Supply Company at 1409-13 Broadway, and will erect a two-story structure with basement on the site of the present building. The company will build its own frame and engine, and buy parts from the parts makers.

FOREIGN AGENCIES FOR QUAKERTOWN.

PHILADELPHIA, Oct. 22.—The Royal Tourist and Rochet-Schneider cars will hereafter be represented in this city by Horace B. Hills, who is directing extensive improvements and alterations to the premises at 130 North Broad street, which will be ready for occupancy about November 15.

Another foreign car which has secured a foothold here is the C. G. V., for which Francis Klauder has secured the local agency. Until he can secure suitable quarters Mr. Klauder will hold forth at the Bellevue-Stratford garage.

CONTINENTAL COMPANY SECURES J. M. GILBERT.

Joseph M. Gilbert has accepted the general management of the American interests of the Continental Caoutchouc Company, of which Willy Tischbein is the president. The Continental headquarters are at 42 Warren street, New York City. Mr. Gilbert for many years has been the sales manager of the Firestone Tire and Rubber Company, of Akron, O.

M. & W. TIRES FOR HALF OF CADILLAC OUTPUT.

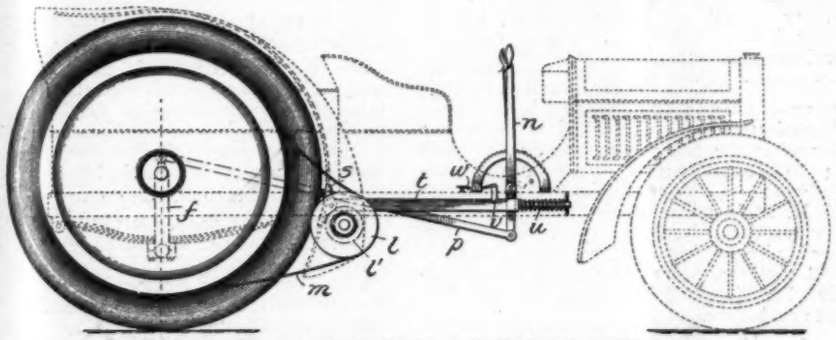
DETROIT, MICH., Oct. 22.—One-half of the 1907 Cadillac cars will be equipped with Morgan & Wright tires. The tire contract is one of the most important ever given, for next year's Cadillac output will be larger than ever.

Patents

Transmission System.

No. 832,636.—B. B. Switzer, of Chicago, Ill.

This is a simple form of belt and friction transmission and brake mechanism for an automobile. The power is applied in any convenient manner to a transverse shaft carrying a double pulley *ll'* at each end. The larger pulleys *l* drive belts *m* running over belt drums on the rear wheels. The smaller pulleys *l'* are located in line with the tires. The axle is connected with the rear springs by swinging links *f* whose position is determined by the hand lever *n* and the long links *p*. When *n* is rocked to carry the axle backward the belts are tightened. When it is rocked clear forward the belts are slack and the small pulleys running against the tires give the reverse motion. Between the neutral position shown and the position of the contact with *l'* the tire comes against a brake shoe *s* located at the end of a horizontal bar *t*. This belt is normally held stationary by the detent *v*, and in this position the brakes act to retard the pulley when the tires touch them. If, however, *v* is released by pressing the pedal *w* the belt *t* is pushed forward against the spring *u* until the tire makes contact with *l'* and the friction of the brake is then only that due to the spring.



SWITZER'S BELT TRANSMISSION AND BRAKES FOR AUTOMOBILES.

Liquid Hydrocarbon.

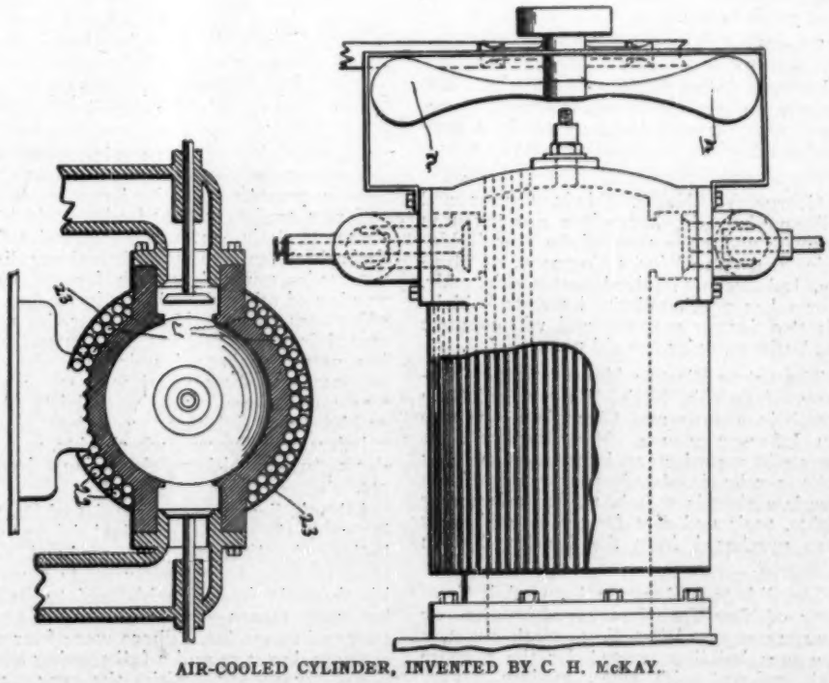
No. 832,409. W. Oppenheimer, of Grantham, England.

This is a liquid suitable for use as a fuel in gas engines and as a solvent and cleaner. It is obtained by a new process from water gas tar, which is the residuum left from petroleum which has been used for carbureting water gas. The inventor states that hitherto water gas tar has not been used commercially, owing to the difficulty of freeing it from water, which cannot be distilled out without strong ebullition and violent shocks. The inventor first dehydrates it by mixing it with substances such as quicklime or gypsum, which combine mechanically with it, after which the mixture is allowed to settle and is decanted. It is then distilled in the ordinary way until only pitch remains, and this crude distillant is treated first with sulphuric acid and afterward with concentrated solution of caustic soda. It is decanted after each treatment, and then redistilled. A perfectly clear and colorless distillate comes out, followed by a yellowish distillate which is separately collected, treated with acid and alkali as before, and again redistilled, yielding a colorless liquid similar to the first. This colorless liquid, which is the product claimed, has a specific gravity between 0.82 and 0.90. Its boiling point is between 100° and 140° Cent. Its chemical nature has not been determined, but it is claimed to be very suitable for the manufacture of varnish and coloring materials, also as a solvent for cleaning, and as a liquid fuel.

Air-cooled Cylinder.

No. 832,803.—C. H. McKay, of Fitchburg, Mass.

This cylinder is cooled by a fan *n* which forces a current of air over the cylinder head and through copper tubes *21-22* which are arranged lengthwise of the cylinder and surrounded by a jacket *23*. The cylinder surface is grooved lengthwise for better contact with the first layer of tubes.

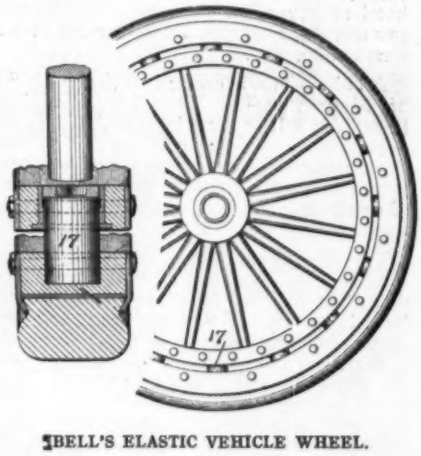


AIR-COOLED CYLINDER, INVENTED BY C. H. McKAY.

Elastic Vehicle Wheels.

Nos. 832,905 and 833,115.—H. Bell, of Stamford, Conn.

These are wheels having a felly surrounding the ends of the spokes and a larger felly carrying a solid tire, and rubber cushions interposed between the two fellies. In the second patent the cushions take the form of cylinders *17*, which are bedded at their ends sufficiently to prevent relative rotation of the fellies. In the first patent the cushions are rubber balls.



BELL'S ELASTIC VEHICLE WHEEL.

NEWS AND TRADE MISCELLANY.

The books of the secretary of state of Iowa show that from July, 1904, to September, 1905, 1,560 automobiles were registered and in the following twelve months 2,565 cars were registered.

The H. H. Franklin Manufacturing Company, of Syracuse, N. Y., manufacturers of the Franklin air-cooled cars, states that out of the many sales made during the first few weeks of the 1907 selling season fully 15 per cent. have been six-cylinder cars.

One of the newsiest house organs yet to appear is *The Silent Partner*, issued by the Globe Machine and Stamping Company, Cleveland, O. In the October number there is some timely comment on trade journalism, the chapter sizing up the situation very concisely.

The F. B. Stearns Company, of Cleveland, O., has received an order from the Santa Fe railroad for a large number of cars to be used in connection with their hotel at Riverside. The cars will be used to meet the Santa Fe limited trains at San Bernardino, Cal.

A building to be erected on the south side of Sixtieth street, New York, has been leased for a long term by the C. G. V. Import Company. The building will be used as a garage and repair shop in connection with the salesroom and office now in course of construction at Sixtieth street and Broadway.

The Hambrick Motor Car Company, of Washington, Ind., has advertised the fact that it is looking for a southern location for a large automobile body plant, and Augusta, Ga., has made a strong bid for the factory. Water power is cheap there and the wood for car bodies is also obtainable at the best rates.

Although it is three months since the Ajax-Grieb Rubber Company started to give a 5,000 mile guarantee with every Ajax tire sold, it has been necessary, according to the company's statement, to make only eleven replacements up to this time, out of the thousands of tires that have been shipped and put into use.

The F. H. Bultman Company has purchased the plant and business of F. H. Bultman, doing business as F. H. Bultman & Co., at 2108 Superior street, Cleveland, O., and will continue to do a general machinists' business and make a specialty of automobile work as in the past.

George W. Kemp, Edwin Carver and Gibson Kennedy, heretofore associated in business under the name of the Muncie Machine and Auto Works Company, of Muncie, Ind., have dissolved partnership. Mr. Kemp has purchased the interests held by his two former partners and will continue the business under the old name.

The Schug Electric Manufacturing Company, of Detroit, Mich., has removed from Beaubein avenue and Champlain street to 321 Jefferson avenue. Hereafter the company will manufacture, in addition to spark coils, a mica insulated spark plug and the Peerless electric switch, the manufacturing rights, tools and dies for the latter having been purchased from the Peerless Switch Company.

The Sidney B. Bowman Automobile Company, of New York, has moved into its new quarters at 225 West Forty-ninth street, a fine new building erected for the purpose and equipped with every modern garage appliance. Here the Clement-Bayard cars will be handled. The racer driven in the Vanderbilt Cup race by young Albert Clement is now on exhibition at the new garage and is attracting considerable attention.

A company will be organized in Columbus, O., to manufacture an air-cooled gasoline motor invented by Frederick S. Harmer of that place. The motor will be incorporated in a 1650-pound runabout and the first cars will be ready for spring delivery. The stockholders will be the stockholders in the Curtin-Williams Company and the necessary capital is ready and everything arranged for the commencement of manufacturing operations.

McCord & Co., of Chicago, have recently secured a controlling interest in the Stolp Manufacturing Company, of Chicago, and hereafter the Stolp radiators will be made at the West Side plant of the McCord company, at 491 West Kinzie street, Chicago. F. H. Stolp will continue to supervise the construction of the radiators. J. M. Hibbard, vice-president of the Stolp company, will continue to act as traveling representative, handling both Stolp and McCord prodists as before.

The 90-horsepower Locomobile racing car driven by Joseph Tracy in the Vanderbilt Cup race is now on exhibition at the Locomobile garage at Broadway and Seventy-sixth street, New York, and the company will be glad to have anyone see the car who cares to do so. Two cars of identical construction were built. The first was driven in the elimination trial, while the second, which seemed to be slightly faster than the first, was driven in the race itself. It is the latter car that is on exhibition.

The Lavigne Manufacturing Company, 130 East Larned street, Detroit, Mich., desires to have attention called to the fact that the litigation over the ownership of the force feed oil pump patented by Joseph P. Lavigne, has been decided in favor of the Lavigne company, which is able to fill all orders for its pump. The decision in favor of the Lavigne company was recently handed down by Judge Donovan of the Wayne Circuit Court. The Detroit Lubricator Company contended that since Mr. Lavigne had brought forth the pump when in its employ, the contrivance belonged to the concern.

C. W. Kelsey, Eastern sales manager of the Maxwell-Briscoe Motor Company, has been commenting on the large number of different trades and professions which are represented in automobile factories, and finds that there are more than thirty different trades pursued in each factory, and a number of other skilled help in clerical and office lines also required. The trades represented include designers, draftsmen, chemists, pattern-makers, foundrymen, moulders, core-makers, sheet metal workers, carpenters, tool makers, general machinists, blacksmiths, brass finishers, assemblers, platers, grinders, upholsterers, wheelrights, painters, decorators, burnishers, electricians, firemen, etc.

John A. Seaverns, an autoist of Boston, is one of those mathematical drivers who believe in keeping a record of what things cost. He recently made a run in his Aerocar from Marblehead to Brooklyn and return—with side trips—a distance of 650 miles. There were four passengers, luggage and a full touring equipment, weighing, with the car, 3,600 pounds. At the end of the journey Mr. Seaverns states that the gasoline consumption averaged 29 1-4 ton miles per gallon, while the total amount of oil used was seven quarts. He goes further and shows that the total cost was only one and one-quarter cents per mile for the whole party, with baggage.

NEW AGENCIES ESTABLISHED.

The Pierce Arrow cars will be handled in Rhode Island and Bristol county, Mass., exclusively by the Foss-Hughes Motor Car Company. Archie E. E. Hughes, secretary of the company, will have direct charge of the territory, with headquarters at 512 Industrial Trust Building, Providence, R. I.

C. S. Henshaw, the New England representative of the Haynes Automobile Company, with headquarters in Boston, in company with John W. Haynes, is making a tour of the important New England towns in the Haynes Vanderbilt Cup racer. The Shepard Company, of Providence, has secured the agency for Rhode Island.

Agencies recently placed by the Wayne Automobile Company, Detroit, Mich., are: Freed & Branford Automobile Co., Salt Lake City, Utah; Automobile Exchange, Birmingham, Ala.; Benton Harbor Bicycle & Auto Works, Benton Harbor, Mich.; J. C. Carpenter, Chester, S. C.; Lothrop-Davis Co., Tonopa, Mo.; J. D. Peck, Peckville, Pa.; D. W. Pales, Guayama, Porto Rico; Selma Gun & Key Co., Selma, Ala.; L. W. Brown, Elkland, Pa.

PERSONAL TRADE MENTION.

Mr. and Mrs. A. Sherman Hitchcock and Mr. and Mrs. George H. Thomas, of Providence, R. I., left on Thursday for a trip by automobile through New Hampshire and the White mountains.

Robert H. Hassler, late designer and mechanical engineer of the Marion Motor Car Company, of Indianapolis, Ind., has taken charge of the experimental department of the firm of McCord & Co., of Chicago.

F. A. Bennett, manager of the Standard Motor Car Company, of Los Angeles, Cal., is to resign that position and take the agency for the Ford and Reo cars in eastern Washington and Oregon, with headquarters at Portland.

James Bayliss, western sales manager for the Elmore Manufacturing Company, of Clyde, O., reports that during a recent long trip in the West he found the prospects for trade in 1907 excellent and anticipates a large business.

George C. John, general sales manager of the Kobusch Automobile Company, of St. Louis, manufacturers of the American Mors car, has gone to the Pacific coast to establish agencies for his car, which is manufactured by the St. Louis Car Company.

H. H. Knepper, formerly treasurer of the Frayer-Miller Motor Car Company, of New York, has been elected to the vice-presidency, of the company, to succeed F. E. Muscovics, resigned. The latter, as announced last week, will represent Brandenburg and Co. in the West.

Bert Morley, late Eastern representative of Hayden Eames, of Cleveland, has resigned that position and has taken the sales managership of the Ferro Machine and Foundry Company, of Cleveland, a concern well known as manufacturers of cylinder castings and marine engines.

Announcement is made by Marcus I. Brock, assistant general manager of the Association of Licensed Automobile Manu-

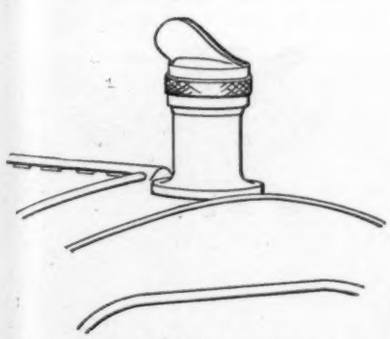
facturers, that a new department has been added to the association—a department of advertising and publicity, under the management of H. T. Clinton. Arthur N. Jervis, the well-known writer, retains his connection with the association, and F. L. Dunn has joined the staff of writers.

Jed Newkirk, once known as one of the leading bicycle riders of the country, is one of the many cyclers who has naturally drifted to automobiling. He has joined forces with H. P. Kutzkan, known for his tours through Death Valley. Newkirk & Kutzkan will have the exclusive sales rights for the S. & M. automobiles and the R. & P. traction tread tires for the state of Nevada, with headquarters at Tonapah, Navada.

Joseph Tracy, who plioted the Locomobile to victory in the Vanderbilt Elimination trial, and made the fastest lap in the recent Vanderbilt Cup race, has been retained by the Locomobile Company as consulting engineer. Mr. Tracy, as is well known, has been a consulting engineer, with offices in New York, for the past few years, which are to be continued, inasmuch as Mr. Tracy does not agree to devote his entire time to the Locomobile Company. The company will, under its contract with him, call on him for advice at such times as may be desired.

A NEW PACKARD FEATURE.

It is the little things that go to make up perfection, and it is very probable that little things left undone have caused the use of more unprintable language than big things.



RADIATOR CAP WITH FIN.

The illustration herewith shows a minor improvement made in the new Packard 30 which will appeal to about every automobilist who has tried to unscrew a tight radiator filling hole cap. Mr. Joy, the general manager of the Packard Company, noticed that in the car used by him personally, the filling cap often stuck, and was difficult to get off. Speaking to "Steve," driver for the sales department, he said:

"Please fix that cap so that it will screw on more easily."

The next day Steve walked into Mr. Joy's office, laid a radiator cap on the desk and remarked:

"I have fixed her, Mr. Joy."

"What the ——, what is that?"

"Why, you told me to fix that radiator cap so she would turn easier, and I files out a groove and sets in that fin. You see, sir, it's the same like a wrench and gives the radiator a high-toned air that is all to the polished brass."

Mr. Joy "saw," showed the cap to the factory critics, turned it over to the drafting room, and now it is a feature of the "Packard-30."

THE GROWING GARAGE LIST.

The Roswell Automobile Company, of Roswell, New Mexico, is building a garage two stories high.

W. H. Hager, of Colorado Springs, Col, will build a garage in that city, commencing work at once.

The large garage of the Middletown (O.) Auto and Cycle Company, on Canal street, is nearly completed and will soon be ready for occupancy.

The Freed & Bransford Automobile Company has been formed in Salt Lake City, Utah, and will conduct a garage business and handle the Wayne car.

George Metz is having a garage built at 99 Jefferson avenue, Grand Rapids, Mich., where he will handle a car that is not now represented in that city.

A new garage, where Franklin cars will be handled, will be opened shortly at the corner of Polk and Turk streets, San Francisco, by D. C. McCord, of the Boyer Motor Car Company.

The establishment of a garage for club members has been proposed by the Louisville, Ky., Automobile Club. There are eighty members of the club and better accommodations for their machines are required.

A building now standing at 790 Woodward avenue, Syracuse, N. Y., is to be torn down and a garage erected in its place. The new building will be 150 by 87 feet, one story high, and will have cemented floor and trussed roof with large skylights.

The Metropolitan Motor Car Company, of Cleveland, O., a new and vigorous concern, is building a fine garage on Euclid avenue, corner of Handy street. The building will be three stories high and will measure 140 feet each way and will have entrances from both the streets on which it faces. Every facility will be installed for the care and housing of cars. The Cadillac and Pierce gasoline cars and the Babcock electrics will be handled. W. C. Anderson and J. T. Pehen are at the head of the company.

A garage has been opened at 434 Seventh avenue, Pittsburg, by D. P. Collins, well known throughout Pennsylvania as a salesman. Columbia cars will be handled exclusively. The handsome three-story brick building occupied is 30 by 170 feet. The first floor will be the show room, the second floor will be the supply department and tire repair rooms and the third floor will be used for storage. Both electric and gasoline cars, all Columbias, will be handled. Mr. Collins was connected with the firm of Banker Brothers for more than five years.

A garage has been opened at 1466 Indiana avenue, Chicago, by Erwin Greer, who has announced the opening of the new place and at the same time his withdrawal from the Greer Motor Car Company. A feature of the new establishment is the livery business, in which a full line of high-class cars will be employed. In addition, new and second-hand cars will be dealt in and all kinds of repairing will be executed. An agency for a well-known machine will be secured and this will be handled at a salesroom to be opened by Mr. Greer on Michigan avenue. This will be ready for business early in January.

An old stone garage that has stood for some seventy years at the corner of Fleet and Porter streets, Portsmouth, N. H., is to be pulled down and on its site will be erected a legitimate successor—a garage. The Granite State Fire Insurance Company will erect the building, which will be among the finest of its kind in the State. The constructional materials will be steel and cement and the building will be fireproof throughout. The floor space will be sufficient for the storage of about a hundred automobiles. The machine shop will be equipped with the best modern appliances, and every comfort and convenience will be installed in the garage. The plans were drawn by Architect W. W. Dinsmore.

AUTOMOBILE STAGE LINES.

A French syndicate in Panama has proposed to the National Assembly to inaugurate an automobile transportation line along the route of a proposed railroad, and to build and maintain roads for the automobiles to travel on.

The management of the Bon Air Hotel, of Augusta, Ga., has contracted with Field & Co. for a big twenty-passenger sight-seeing automobile for the use of the hotel guests. The machine, a Knox, is being built specially for the work.

The Daytona Auto Transit Company is a Florida concern which has placed in operation a line of 'buses connecting Daytona, Seabreeze and Daytona Beach. The line will be in thorough operation before the arrival of the winter tourists.

By the first of November there will be an automobile 'bus operating along the route laid out by the New Auto Transit Company, of Jacksonville, Fla., running through Daytona, Seabreeze and Daytona Beach. If the demand for transportation warrants, a second 'bus will be running a month later.

RECENT INCORPORATIONS.

Iams Motor Car Company, Pittsburg, Pa.; capital, $12,000.

Excelsior Spark Plug Company, Cleveland, O.; capital increased from $10,000 to $20,000.

Guarantee Auto Supply Company, Camden, N. J. Incorporators, John A. MacPeak, Joseph F. Cotter and F. R. Haussell.

Automobile Schools of America, New York; capital, $25,000. Incorporators, W. H. Hussey, G. H. Mann and J. W. Spencer.

Commercial Vehicle, Inc., New York; capital, $5,000. Publishing. Incorporators, H. F. Donaldson, H. W. Perry and H. W. Jessup.

A. G. Southworth Company, New York; capital, $100,000. Incorporators, J. W. Sutton, A. G. Southworth and Lillian R. Southworth.

The Albany Automobile Company, Albany, Ind.; capital stock, $10,000. Incorporators, Jas. B. McNary, John L. Tully and William L. Cory.

Wald Individual Motor Company, New York City; capital, $1,000. Directors, Louis Nashley, David Wald and E. A. Leffron, New York.

The Postal Auto and Engine Company, Bedford, Ind; capital, $20,000. Incorporators, Sherman L. Keech, Charles A. Walker and Jess O. Greenland.

Essex Automobile Company, Newark, N. J.; capital, $5,000. To manufacture automobiles. Incorporators, A. Somerville, C. E. Wyckoff and J. M. Somerville.

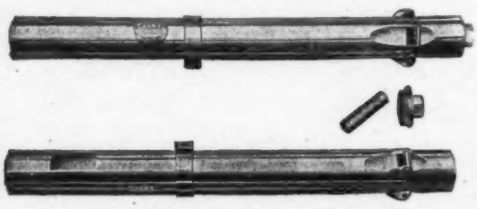
Monarch Motor Car Company, Cleveland, O.; capital, $25.000. Incorporators, Edwin J. Guthery, W. B. Drown, Bernard J. Guthery, James I. Gemmill and E. C. Gessner.

The Automobile Company, San Francisco, Cal.; to engage in a general automobile and transportation business. Incorporators, J. F. Murdock, F. L. Bonn, W. W. Brackett and F. V. Keesling.

INFORMATION FOR BUYERS.

SOAP FOR AUTOMOBILISTS.—Every automobilist knows how easy it is to get his hands covered with the grime of machinery, and he also knows—and remembers without memory jogs—how difficult it is to get rid of the grime. Ordinary soap does not seem to fill the bill, however good it may be for other purposes. The problem has been attacked in an ingenious manner by John T. Stanley, of 363 West Thirtieth street, New York, in a new compound called Shofo. In this there is as a foundation green Castile soap, which is supplemented by very finely pulverized pumice stone and the whole thinned down with green olive oil. The soap washes, the pumice scours the dirt from the lines and hollows and the olive oil keeps the hands soft. The pumice is too finely ground to injure the skin in any way. The compound is put up in half-pound and one-pound cans.

NEW GABRIEL HORN.—The 1907 model of the well-known Gabriel horn, manufactured by the Gabriel Horn Manufacturing Company, of Cleveland, O., differs in a number of details from the original model. The most noticeable change is in the use of a single tube, subdivided into three chambers, instead of a pluralty of separate tubes as in the older types. The new arrangement saves a great deal of space and at the same time makes several other improvements possible. The three tones of the three chambers are better blended than in the individual tube type, and there is an expansion chamber into which the gases are led before they are allowed to enter the tubes. The result of this is a softer and more melodious tone and one that can be indefinitely maintained without loss of tone quality. The whole horn can be taken to pieces without difficulty and any deposit of dirt or carbon removed. The valve has also been greatly improved and offers far less opportunity for the accumulation of carbon than the old one. The new Gabriel horn is made in four sizes and can be used on any gasoline or steam car. The cut-out valve has been improved and is furnished as part of the equipment of every horn. The company continues to manufacture the Foster shock brake, which consists of a small cylinder filled with oil and a plunger pierced with holes through which the oil is forced by sudden jars of the car, the slow movement of the plunger preventing the violent recoil of the springs that is such a nuisance and annoyance to automobilists.

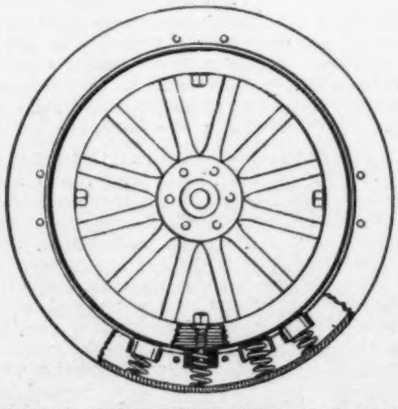


GABRIEL HORN COMPLETE AND DISMOUNTED.

CHAMPION TWINS.—Under this title the firm of Patterson, Gottfried & Hunter, Limited, of 150 Center street, New York, refers to its "High Low Jack" and its automobile tool outfit. The jack has already been described and illustrated in THE AUTOMOBILE; the tool set consists of twenty tools of the highest grade and greatest usefulness, selected for their adaptability to automobile roadside repair work and their ability to withstand rough treatment. The tools are packed in a canvas roll with the necessary flaps and straps to keep it closed, and occupies a remarkably small space, considering the wide range of usefulness of its contents. Two amusing little booklets, cleverly illustrated, describe the "Twins."

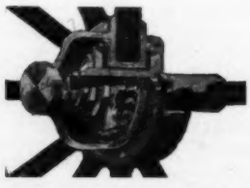
SPRING WHEEL.—The idea of using spring wheels to give resiliency necessary to carry an automobile comfortably over rough roads, instead of using pneumatic tires, has occurred to many inventors, and many different applications have been patented, but great difficulty has been experienced in practical work. One of the latest of these, and one that the manufacturers state to be thoroughly practical and to have been well tried out in actual road work, is the H. S. Pullman patent spring wheel, built by the Pullwin Wheel Company, of 37 Colony street, Meriden, Conn. The accompanying illustrations show the construction of this ingenious wheel quite clearly. The ordinary wood wheel has a steel rim, and over this there is a steel channel or rim which is normally held in a position concentric with the fixed rim by spiral springs, but which is permitted to move against the springs when the weight of the car is resting on the wheel. Driving stresses are transmitted through four steel studs which project through the rim of the wheel and carry hardened steel rolls which engage with crossbars on the inner side of the outer rim. The effect of the whole arrangement is that of an inner wheel separated by springs from an outer wheel. A rubber cushion covers the outer rim or tire and this can be renewed with ease when it becomes worn. The springs used are of specially tempered steel wire and are exceedingly durable. They are copper plated and enameled to prevent rusting and are scientifically proportioned to their work. As a practical test, some of these springs were compressed and extended to their full capacity 1,500,000 times, the manufacturers state, without perceptible decrease in their efficiency.

SECTION THROUGH RIM OF PULLMAN WHEEL.



PULLMAN SPRING WHEEL SHOWING SPRINGS.

BALL BEARING WHEEL.—A ball bearing wheel of interesting and unique design is built by the Federal Automobile Company, of First National Bank Building, Chicago. One of the strong features of this wheel is that if anything happens to the balls—if one should break, as balls sometimes will—the wheel will not be put out of commission or even damaged, for there are so many balls used in each bearing that the loss of even two or three will not seriously affect its work. In case of more extensive damage, sufficient to greatly reduce the number of balls carrying the load, the wheel will come down to a plain bearing provided for the purpose and run exactly as a plain bearing wheel until new balls can be obtained and inserted—which can be done by the user without the assistance of a mechanic. Broken balls will not run around the races and play havoc, but will fall out of the races and out of the way of the good balls. The ball races are very large, and to make room for them they are placed in the largest part of the hub. Balls are of large diameter and are more numerous, the manufacturers state, than in other ball bearing wheels. Wheels are the standard Sarven wood wheels with flanges of steel instead of malleable iron. With these ball bearings the largest axles can be used. The Federal wheels are made for all classes of vehicles, from light electric runabouts to the most ponderous commercial vehicles.



HUB OF FEDERAL BALL-BEARING WHEEL.

NEW PUNCTUREPROOF TIRE.—There is a world of comfort in the positive knowledge that when you start out in the car in the morning you will get home again without any suspicion of trouble, so far as the tires are concerned, and that even if the tires are pierced by nails or the like it will make no difference whatever. This was the opinion of the Punctureproof Tire Company, of 707 American Trust Building, Cleveland, O., in bringing out a tire that is claimed to be as easy riding as a pneumatic, while free from the possibilities of the trouble inherent in the ordinary pneumatic tire. The Punctureproof tire has extremely heavy walls of the best grade of rubber, enclosing a small chamber which, however, has no inner tube and no air under pressure. A cross section of the tire shows that the rubber does not form a continuous ring, but is split from the air-chamber to the rim through the base. These tires are applied to ordinary clincher rims by special machines of a well-known type, which compress the rubber and allow it to expand into the clincher rims, where it holds securely.